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Illinois Medical Journal

OFFICE OF PUBLICATION 3338 OGDEN AVENUE, CHICAGO

Vol. XXXI, No. 1 CHICAGO, JANUARY, 1917 $2.00 a Year

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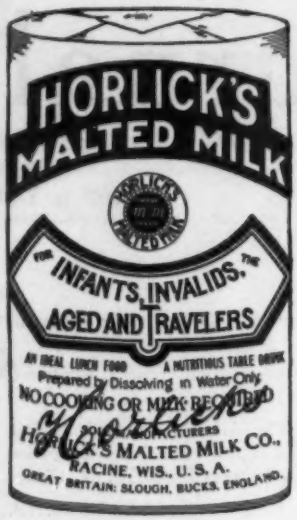
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VOL. XXXI CHICAGO, ILL., JANUARY, 1917 NO. 1

Original Articles

THE ROENTGEN DIAGNOSIS OF CHEST LESIONS.*

ADOLPH HARTUNG, M. D.,

CHICAGO.

Roentgenologist, Henrotin Policlinic and Alexian Bros. Hospitals and University of Illinois School of Medicine.

The object of this paper is to present Roentgen findings which may serve directly or differentially in the diagnosis of more or less obscure lesions in the chest and give material information regarding their prognosis and treatment. In many of these conditions the findings are sufficiently characteristic to base a diagnosis on them alone;

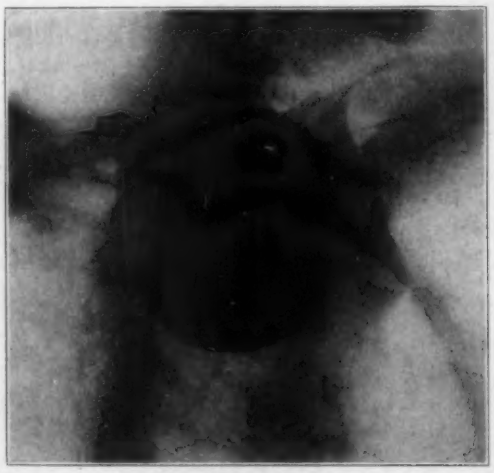

Fig. 1. Large Pressure Diverticulum of Upper Esophagus.

oftener, however, they are merely supplemental and confirmatory, and in no wise supplant other methods of examination. The title was purposely made indefinite and comprehensive to permit consideration of conditions which present similar symptoms clinically, and do not point directly to the point involved.

*Read before the North Side Branch, Chicago Medical Society.

Before considering the chest proper, two conditions occasionally discovered in chest examinations by the x-ray will be referred to. A persistent thymus may be shown as a triangular shadow over the heart or great vessels and be associated with dyspnea or spasmodic asthma. An unsuspected substernal goiter or neck tumor may disclose itself by compression of the trachea and encroachment on its lumen and explain an otherwise unaccountable dyspnea.

Fig. 2. Case of Cardiospasm With Dilated Esophagus.

Lesions of the mediastinum may cause symptoms referable to the digestive, circulatory, or respiratory systems, or they may cause general symptoms without focal manifestations. If difficulty in swallowing is the predominating com-

plaint, attention is directed to the esophagus primarily and the giving of an opaque paste of variable consistency will demonstrate the presence of an obstruction within or external to that organ. Ordinarily food requires about six seconds to reach the stomach. In stricture, whether traumatic and benign or malignant, it may be much delayed, and if diverticula be present these may retain their contents for many hours. Spasm of the cardia if long continued may cause much

Fig. 3. Case of Carcinoma of Esophagus With Marked Constriction.

dilation of the esophagus with retention and subsequent dyspnea.

Dysphagia may likewise be caused by mediastinal tumors or aneurysms, although with these respiratory or circulatory symptoms usually predominate. Lymph glands may become much enlarged as in Hodgkin's disease or glandular tuberculosis and cause pressure on the surrounding structures. New growths such as sarcoma or endothelioma may be readily demonstrated. These can usually be differentiated from aneurysm by the lack of pulsation and irregular outline. Excepticnally the differentiation is practilly impossible as in a case where tumor was diagnosed and autopsy following death by hemorrhage revealed a mass of enlarged tubercular glands closely adherent to wall of aorta, which was distended to

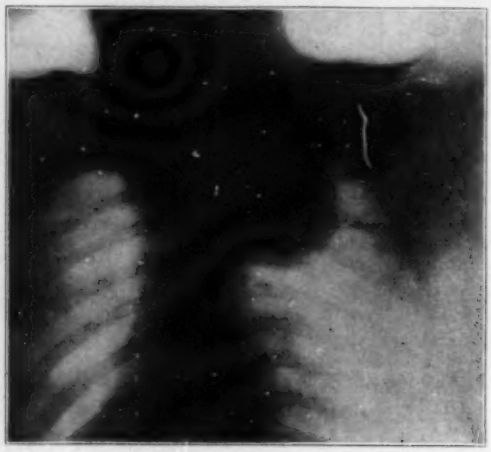

Fig. 4. Case of Sacular Aneurysm of Arch of Aorta.

small aneurysm. Dilation or aneurysm of the aorta or its large branches can be easily recognized on the fluoroscopic screen.

Occasionally a toxemia such as follows an infection may be shown to be associated with enlarged mediastinal or bronchial glands and in

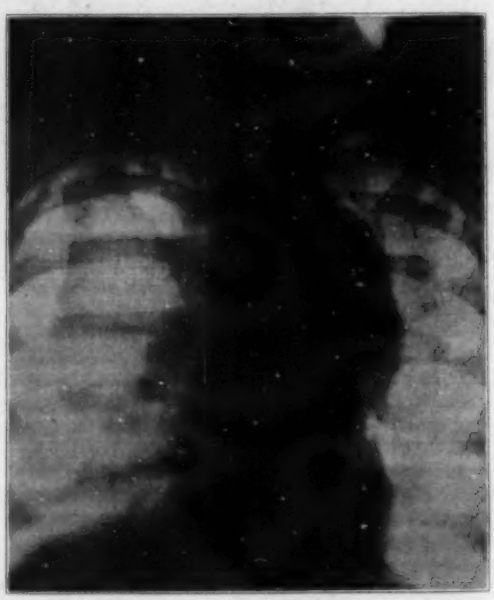

Fig. 5. Case of Mediastinal Tumor Composed of Much Enlarged Tubercular Glands and Small Aneurysm of Aorta.

the absence of other pathology to account for the symptoms, it may reasonably be assumed that a casual relationship exists between them. Children of a tubercular tendency reacting strongly to tuberculin but showing no evidence of the disease elsewhere should be examined Roentgenographically, for such glands are often found present and this examination is the only one capable of demonstrating them conclusively.

In the diagnosis of heart lesions the x-ray is of far less value than the stethoscope. Definite valvular lesions present fairly definite and characteristic pictures, but these are far from infallible. As regards the size, far more accurate outlines can be obtained by the x-ray, especially if the orthodiagraph or teleroentgenographic methods are used than can be elicited by even the most careful percussion. The age of the individual,

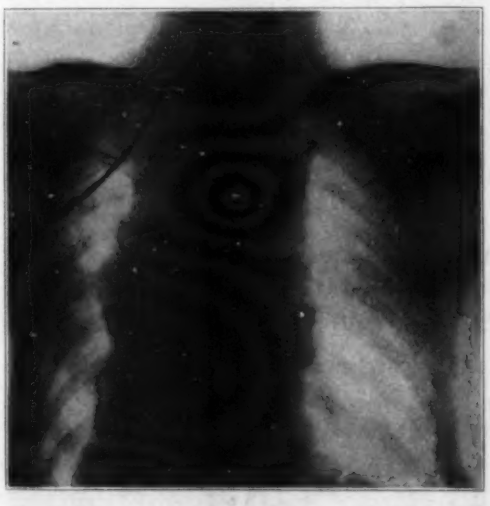

Fig. 6. Large Mediastinal Tumor. Autopsy Showed This to Be An Endothelioma.

shape of chest and other factors materially influence the picture presented, even in normal cases. Drop heart is often associated with tuberculosis or in individuals of the asthenic type.

In the course of some work done in conjunction with Dr. Williamson, to determine the effect of exercise on normal and pathological hearts, it was found that considerable information could be elicited regarding the functional efficiency of the cardiac muscle. Exercise causes diminution in the size of normal hearts and even in many pathologic ones, and the amount of this contraction may be used as an index to its functional capacity.

The x-ray gives positive information in cardiac hypertrophy, dilation, and such congenital conditions as persistent ductus arteriosus.

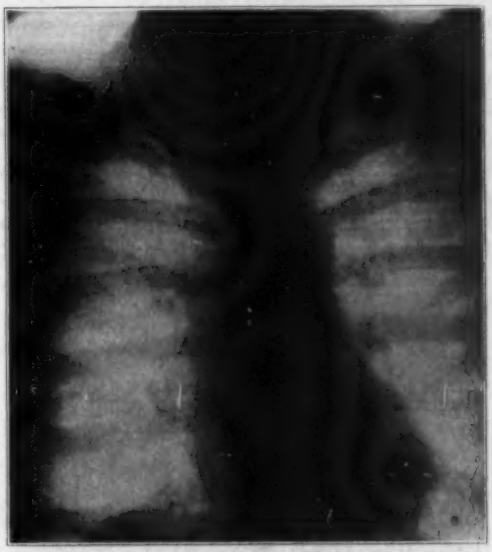

Fig. 7. Enlarged Para-Tracheal Gland.

Situs inversus is, of course, easily demonstrable by the x-ray, and cases of supposed transposition due to adhesions or pressure are readily differentiated.

The value of the x-ray in the diagnosis of pul-

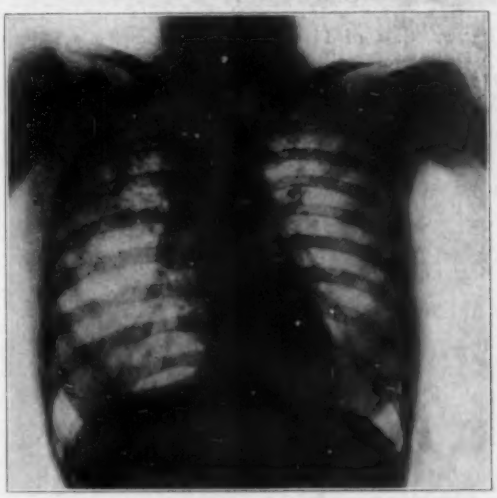

Fig. 8. Advanced Tuberculosis of Lungs With Numerous Calcareous Deposits.

monary lesions is hardly recognized as generally as it deserves to be. This is due partly to the fact that too much reliance was formerly placed on a single plate. To give information commensurate with its possibilities, a fluoroscopic examination plus an antero-posterior and a postero-anterior exposure (or preferably stereoscopic ones) should be made. Great care is necessary in interpreting the various shadows, and due allowance should be made for variations from the ordinary which may still be within the realm of normal. This refers especially to hilum shadows, a compound shadow composed of bronchial walls, blood vessels and lymph channels and nodes. To this may be added the presence of particles of

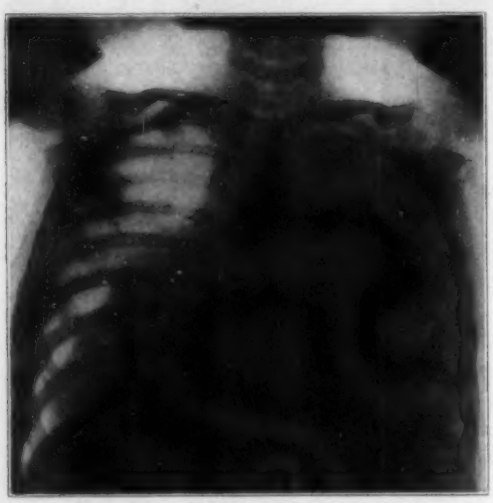

Fig. 9. Case of Pleural Effusion Completely Filling Right Chest.

various kinds of dust. Secretion in the bronchi with fibrosis might readily be confused with a possible tuberculosis of the bronchial type. Bronchiectatic cavities likewise are not sufficiently characteristic in many cases to permit of positive diagnosis. Tubercular lesions, which may have long since passed the active stage and become healed, may leave scars which closely simulate active ones on roentgen examination. Thus calcareous deposits are often visible where no clinical signs or symptoms are present. It has been asserted that sharply outlined consolidation shadows meant a healed process, but this fact has not been proven conclusively.

In pulmonary tuberculosis the x-ray can give much valuable information. The findings in incipient cases are rather vague; until appreciable areas of consolidation have formed no evidence of the condition may manifest itself on the roentgenogram. If the condition is unilateral the

Fig. 10. Large Pulmonary Abscess. Plate Taken With Patient Lying on Side.

diaphragm may show some lagging on the affected side or the apex may not light up as brightly as on the well side. On the other hand, if the affected areas are so situated that they are not readily accessible to stethoscopic examination or percussion, the x-ray may furnish earlier evidence than can be obtained otherwise. When consolidation appears the x-ray certainly offers more accurate methods of determining its extent and location than other means. Then, too, the

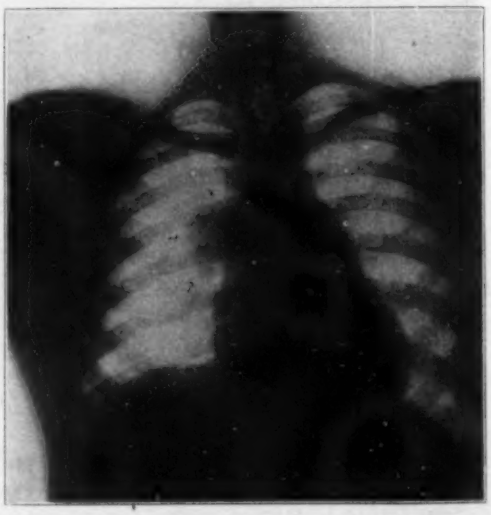

Fig. 11. Metastatic Sarcoma at Hilum of Right Lung Following Sarcoma of Humerus.

progress of the disease can be followed in a graphic way.

In acute conditions of the lung such as pneumonia or bronchopneumonia the use of the Roentgen examination is rarely indicated, unless it be in atypical cases for differential diagnosis. Here the consolidated areas can be clearly shown. Later on, if resolution is delayed, it is of great value in locating abscesses and empyema, and in the latter condition it may offer valuable aid to the surgeon as to the best site for operation. Late results such as atelectasis can be shown.

Pleural effusions, be they serum, pus or blood, can be readily demonstrated both as to the extent and location by the x-ray, but no differentiation as to the nature of the fluid is ordinarily possible.

Fig. 12. Metastatic Carcinoma of Lungs.

The fibrinous variety of pleurisy may leave adhesions which are visible on the screen, but great care must be used not to confuse normal irregularities for adhesions of the diaphragm. Irregularly thickened pleura may simulate tuberculous consolidation.

Such general conditions as emphysema or asthma, rarely show findings of value. Pulmonary congestion and edema can be shown, but are of greater interest than value.

Malignancy of the lung is comparatively rare, the secondary variety being found oftener than the primary. It usually occurs as multiple metastatic foci. Carcinoma tends to radiate outward along the bronchi, whereas sarcoma usually shows a more or less rounded area of consolidation distributed irregularly throughout the lungs.

Occasionally Roentgen examination of the chest reveals condition which have their origin elsewhere. Thus a hernia through the diaphragm or marked displacement upward, due to a pathologic condition below, may be discovered. Likewise, an examination of the chest preceding one of the gastro-intestinal canal, may give information of unsuspected lesions, which may be the etiologic factor responsible for the patient's symptoms. A heart or lung lesion which might have been overlooked may be thus disclosed.

Although much still remains to be definitely determined in regard to the Roentgen diagnosis of chest lesions, especially in the field of interpretation, enough positive information can be derived to warrant a routine x-ray examination in all obscure conditions.

25 E. Washington Street.

HEALTH INSURANCE FROM THE STANDPOINT OF THE PHYSICIAN.*

GEORGE THOMAS PALMER, M. D.,
President of the Illinois State Association for the Prevention of Tuberculosis; President of the Illinois Public Health and Welfare Association; Director of the Springfield Open Air Colony.

SPRINGFIELD, ILLINOIS.

A short time ago, in the editorial pages of a medical journal, there appeared the statement: "Health insurance in inevitable and the physician may as well make the best of it." There seems to be little question but that health insurance is inevitable, and whether we, as a state and nation, make the best of it or make the worst of it, depends very largely upon the medical profession. As a subject which affects us vitally, we as physicians must approach it thoughtfully. As a problem which means so much to the rank and file of the working people, we must consider it broadly and unselfishly.

Like other steps in social progress, it cannot be stopped by our opposition. It may lie within our power to delay it temporarily, but eventually it will come. When it does come, it will necessitate a large readjustment of the relationship of the physician to the people. This readjustment will be less disturbing if the medical profession

*Presented before the New England Conference on Tuberculosis, New Haven, Conn., Oct. 12, 1916.

will interest itself in health insurance and will act thoughtfully in moulding legislation than if we array ourselves against it and find ourselves ultimately in a place where the laws are passed regardless of our protests.

What the exact nature of the health insurance law should be, is quite beyond the province of these remarks. I have no intention of offering arguments for health insurance. The facts that thirteen European nations already have the system in operation and that many of the states of the Union are considering legislation leading toward its adoption here, indicate that there is nothing fanciful, Utopian or experimental about it.

We have before us certain essential facts which confronted these European nations. The great mass of working people are more subject to disease than other classes. This illness imposes a serious loss upon these people, a loss which they,—less than any other class,—are able to bear. The expense of illness, in loss of time and cost of care, deters these people from seeking medical aid when the disease is preventable or easily curable. Further, this class is probably less capable of selecting competent medical service than other classes.

We are also confronted with the facts that employers are bearing a part of this cost in losing essential parts of their industrial machinery through unnecessary illness, and that the communities are sustaining a loss through industrial inefficiency and through the extension of communicable disease, due to lack of prompt and competent medical supervision.

Our problem, then, in addition to cash compensation for time lost and provision for the burial of the individual, is to guarantee to the working classes that character of medical service which will prevent or minimize or speedily cure disease, and to provide the service under such conditions that the individual will readily avail himself of it.

In the opinion of the average working man, a doctor is a doctor. He has little conception of the very wide difference in the character of medical service which one physician may render as compared with that of another. In most of the ventures which have been made in privately conducted health insurance in this country, the same impression seems to prevail. Lodges and fraternal organizations, as a rule, place so small a valuation upon medical service that they can attract only very young and inexperienced physicians or those who are unsuccessful in the ordinary pursuit of their profession. One is impressed, in considering their scales of compensation, that they have little thought except to purchase the medical title;—that the one requisite is that their physicians shall be legally authorized to practice and may follow their calling without colliding with the arm of the law.

While the standards of medical education have been steadily raised in most of the states in the past few years, the advance has been very recent and the standards are not yet such as to justify the assumption that medical licensure guarantees that a man is competent to practice. In the majority of states there is still a very large percentage of the medical profession of most meager scientific qualifications with hundreds and thousands void of even ordinary, fundamental education. To a large extent, it is from such physicians,—incapable of attracting the better kind of practice and satisfied with modest compensation,—that the poorer classes of our working people are receiving their medical care. It is from these classes of physicians, incidentally, that many of the existing health insurance organizations are recruiting their medical men.

This condition in the medical profession, which is in no way denied by representative and democratic medical bodies, must be given serious consideration if the health insurance of the future is to realize a great deal of what we are disposed to expect from it. The provision of incompetent medical service, though it be free as the desert air or even obligatory, will not bring us any of our desired ends.

A short time ago, Dr. Richard C. Cabot, of Boston, contributed a series of articles to a popular magazine in which he held, in substance, that the middle class do not receive as good medical service as either the very rich or the very poor. The very rich are able to employ as competent physicians as they are intelligent enough to select. The very poor,—if residing in large centers of population and if willing to be recognized by the humiliating term of "worthy poor,"—may avail themselves of dispensaries or hospitals in which the service is highly specialized and rendered by physicians of prominence and unusual skill.

There is nothing particularly new in this statement of Dr. Cabot's; but it caused considerable flurry in certain elements of the medical profession and considerable adverse criticism on the part of some of the medical journals. This flurry and criticism, I take it, were not based upon the fact that Dr. Cabot had said anything revolutionary or untrue; but rather that he had betrayed a rather delicate trade secret.

With the enormous strides of scientific medicine, the mastery of the entire subject by any one individual is an utter impossibility. That a physician is even reasonably efficient in all of the branches of medicine and surgery,—as some of them unquestionably are,—implies extraordinary and very exceptional ability.

The general practitioner of the entire field of medicine has not deteriorated. In fact, his intellectual attainment and equipment are generally much greater than those of his forefathers. Medicine has simply grown to a place where it is beyond the limits of one individual mind. The one-man band of the vaudeville may require infinite skill and dexterity on the part of the performer; but it cannot be said to produce satisfactory harmony or musical effect.

The dispensary or hospital, available to the poorer man who is willing to brand himself a dependent in a larger city, represents the development of the various branches of medicine to that degree of accuracy which is capable of the diagnosis and successful treatment in the incipiency of disease and the prevention of serious outcome,—such accuracy as we must seek in the fruition of our plans for health insurance. Yet much of the possible value of such institutions is lost because the poorer people are not accustomed or educated to seek medical aid when only moderately ill. They usually do not appear for treatment until actually unable to work, which means,—in some of the more serious and insidious ailments,—until the disease has gained a firm hold upon them.

In the general plan of health insurance, as I understand it, this will be largely overcome by the fact that the employer will urge the employed to seek medical aid early, even at the expenditure of a reasonable amount of working time. Employer and employee will be equally interested in maintaining the health of the workman.

If it be true that, under existing conditions, the rank and file of the people in moderate circumstances are receiving medical service inferior to that obtainable by the very rich or the very poor, the logical conclusion is that those in medium circumstances should have provided for them the character of service now available to their more opulent and less opulent brothers. This probably means that the individual, all-around physician should give way to groups of medical men working together and competent to render the highest degree of medical care in all its special phases.

That there is urgent need for more specialized medical service is apparent to no group of people more than those engaged in tuberculosis work. It is an open secret that one of the most difficult barriers in the nation-wide anti-tuberculosis crusade is the failure of the medical profession as a whole to diagnose tuberculosis in its earlier and curable stages. Statistics as to individual ability can be nothing more than a wild speculation; but I am willing to venture the opinion, for what it is worth, that not over twenty-five per cent of the physicians in the average community, large or small, have acquired the art of early diagnosis in this particular disease, or, if they have acquired the art, not over twenty-five per cent are utilizing it.

When we take into consideration the great prevalence of tuberculosis among those who will be affected by health insurance,—when we recall the figures obtained in Fall River in 1907, showing about thirty per cent of deaths among industrial workers to be due to tuberculosis as compared with ten per cent among those not so employed,—the foregoing statement becomes exceedingly significant.

The series of articles by Dr. Cabot indicates that there is a beginning tendency in the United States toward group practice,—such as has been so successfully developed by the Mayo's of Rochester, Minn.,—as the means of improving the general character of medical service. At present, as stated, this high-grade specialized care is available to the very rich and to the very poor residing in large cities having free hospitals and free dispensaries. There is no such provision for the poor in the smaller localities, while even the free dispensaries are objectionable to a large percentage of the better and more self-respecting working people. This is especially true of hospitals and dispensaries affiliated with medical schools

where the patients are used as clinical material for teaching purposes.

It occurs to me that the introduction of health insurance in the United States affords an unusual opportunity not only to give to the working people a particularly high grade of medical service, but to elevate the standards of medicine for all classes of people throughout the entire nation. If the medical service obtainable through health insurance could come from groups of physicians selected for their fitness in the various professional lines, these two desirable ends would be assured. It is not necessary that the service should be confined to a single group in the individual community. There could be several such groups from which, if deemed expedient, the insured could make his own selection. The service, however, would be rendered by the group and not by the individual. In fact, any and all physicians in the community could form themselves into these groups, the only condition being that the groups be competent and sufficiently rounded to give efficient medical care.

To attain such an end would require a very definite governmental supervision and such a plan as that suggested by Dr. A. C. Burnham, of New York, in the *Medical Record*, has much to recommend it. Dr. Burnham suggests that health insurance should be carried out in close association with local health departments (so that there would be a recognized, governmental head to it), and that the executive supervision of the project should fall within the province of the State health department.

The advantage of such a plan seems obvious. The official status of the State health department would simplify the matter of organization and rid the project, to a large extent, of the suspicion of favoritism. This close co-operation with public health officials would go far toward assuring the prevention of communicable disease and the promotion of health, which is a very important part of our program.

We must bear in mind that the ideal clinical staff, however competent they may be in their individual lines, would not necessarily be efficient in disease prevention. The mere fact that a man is a doctor no more implies that he is qualified in preventive medicine than that he is successful in abdominal surgery. The organization necessary to carry out our aim in health insurance must include sanitarians as well as diagnosticians and therapists and, inasmuch as all of our plans contemplate participation by the State government, the interests of efficiency and economy point to the State health department as the proper supervising agency.

As to the personnel of the regular groups, it may be said that, left to the individual community and to boards made up only of employers and employees, the likelihood of obtaining more than very mediocre medical men is by no means great.

The medical men for this service, in Dr. Burnham's plan, would be selected by civil service and their employment would in no way be disturbed by politics or the changes of administration. Dr. Burnham suggests, in addition to a regular full-time staff, a group serving part-time and consisting of a pathologist, a nerve specialist, a surgeon, an eye, ear, nose and throat specialist and a dentist. In view of the importance of tuberculosis among the working people, in my opinion, there should be added a man of special skill in the diagnosis and treatment of tuberculosis,—which means something more than the average internist.

This group of physicians of special training does not mean that the individual would run the gamut of a score of specialists before receiving relief for his minor ill; but it does mean that there would be available a staff which would guarantee accurate diagnosis, which would guarantee the recognition of the obvious ailments in their earlier stages and guarantee appropriate treatment in all cases. It would mean the prevention of much illness; the shortening of most illnesses; the avoidance of many serious complications and sequelae and the avoidance of those unfortunate mistakes and delays in diagnosis which may spell the fate of the individual.

In addition to this,—although this may be beyond the point in the discussion of health insurance,—such service for those of modest means would bring infinite benefits indirectly to those in better circumstances. The acceptance of inferior medical service is not confined to the poor nor to the otherwise uneducated. No method of education is so effective as actual demonstration. The mechanical model is more convincing than a chart or picture and the men and women actually doing things are more convincing than mechanical models.

I am impressed that if, in the establishment of

health insurance, we can procure high-grade, scientific and painstaking medical service for the vast army of employed, we will demonstrate to those in better circumstances,—who employ their own doctors,—that there is such a thing as a competent physician and such a thing as an incompetent physician.

We can convince them that a doctor is not simply a doctor. We can place a premium upon medical skill and more thorough professional training. We can make the *trade* of doctoring unprofitable and definitely discourage the low grade medical college, or stimulate it to the adoption of higher standards. In no other way can the standards of medical efficiency throughout the nation be so rapidly raised. Regardless of the general recognition of the advantage to physicians and laymen alike through the highest level of professional training and skill, that level is reached more effectively by the press of commercial necessity than by a simple reliance upon high ideals.

I appreciate fully that such a plan as I suggest will arouse vigorous opposition. There will be scathing denunciation of the "high-brow" and the "self-anointed." There will be complaint of a system which attempts in any way to alter the present status of the family physician. There is in the medical profession a conservatism which, while usually right, at times gives the impression that we are blocking or obstructing social progress. We do not take kindly to new things affecting our medical institutions.

The adoption of a plan of health insurance of any kind will in itself practically revolutionize medical practice. The very contemplation of this revolution is already alarming some of the more conservative. We have learned from past experience, however, that we can readily adapt ourselves to radically changed conditions and that those steps in social affairs which seem most threatening usually prove to be blessings in disguise.

And if this revolutionary change in medical affairs is coming as a part of the steady march of progress, regardless of our opinion about it, it seems the one auspicious time to adjust our methods and to adopt the plan which will best meet the needs of the people for the next half century to come. The adoption of a group method of practice coincidentally with the adoption of health insurance will cause little more disturbance in our relationships than the adoption of health insurance alone.

Perhaps the plan I propose is too idealistic. Perhaps I am suggesting for a class of people, many of whom now receive no medical care except in extreme illness, a quality of service even superior to that which persons in good circumstances now obtain. However, the establishment of this great new machinery in the several states seems to be a splendid opportunity for a step ahead in the direction in which the highest type of medical service is tending. If the service is established with low standards, it will take many years to bring about definite improvement in it. The incompetent is more easily kept out of the saddle than he is dislodged after once being established.

I appreciate that general assemblies are reluctant to pass laws which arouse protest and I am also aware that this reluctance of general assemblies is responsible for the low standards tolerated in our medical practice acts.

On the whole, it may be advisable to accept the judgment of the county medical societies as to those physicians eligible to health insurance service. This will not assure a particularly high grade of medical skill; but it will guarantee reputable and decent medical men, which is perhaps more than can be expected if the selection is left entirely either to the employer or the employed.

DEMENTIA PRÆCOX STUDIES*

THE PRESENT CONDITION OF ETIOLOGY AND INDICATIONS FOR TREATMENT

BAYARD HOLMES, M. D.
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I make no apologies in coming before you after three years with another essay on dementia præcox. I know it is not a popular subject, but you recognize that this paper is not a pot-boiler. This is a terribly tragic and ominous subject from which our profession and our people are prone to turn aside.

There are today more than 150,000 cases of dementia præcox in public custody in the United States, and fifteen thousand young people, or fifteen regiments of youths, are committed to a hopeless custody each year, and yet

*Presented at the North Branch Medical Society, Chicago, Nov. 16, 1916.

no book on this subject has ever been published in the English language, and no laboratory has been established on the face of the earth designed to solve the ominous riddle of this disease.

Three years ago I presented the evidence furnished by the defensive ferment reaction that there was a physical basis for the youthful insanities. I showed some of the tests and explained the theory of the action of the enzyme on the substrate, and the theory of the origin of the defensive enzyme in the blood.

Since that time the reliability of the dialyzing method of disclosing the characteristic defensive ferments in the blood of dementia præcox patients has been fully established in my own laboratory by myself, and, much more carefully and effectively, in the laboratory of the Psychopathic Hospital by Dr. Julius Retinger. In this particular method, which has seemed to arouse the antagonism and frenzy of the professional research men of America, Dr. Retinger has proved himself a technical expert. His dialyzers are superior to any on the market and his technique follows without ostentatious modifications the original technique of the author of the method. Of the theory and its reliability it is not incumbent upon me to speak.

Only through the unusual hospitality and kindness of Dr. Adam Szwajkart, have I had the opportunity to study a few cases of dementia præcox as they came into the Psychopathic Hospital, and only through the courtesy and assistance of the warden, the pathologists, and every member of the attending and the house staff of the Cook County Hospital, and especially of Dr. E. Blaine, the Roentgenologist, could the all-too-meager studies which we have accomplished during the past two years have yielded such hopeful and promising material looking toward the solution of the problem.

These are the results of laboratory and literary research bearing upon the condition of the dementia præcox patient which you should bear in mind:

1. The defensive ferment reaction is adequate to demonstrate in the blood of four-fifths of all cases, clinically diagnosed as dementia præcox, defensive ferments against substrates of the sex glands, some glands of internal secretion, and cerebral cortex. Analogous conditions were not found in the blood of seventy lodging house tramps, but some ferments were found in pneumonia, in exophthalmic goiter, and in syphilis. It has now been pretty well demonstrated that each of those conditions is a toxic process resulting from infection, and that each specific toxin has a selective action on the gland tissue it attacks. Thus in pneumonia the lipoid of the adrenal cortex and certain elements in the testicle disappear during the first hours of the disease and do not return until some months after recovery.[1] We have, therefore, presumed that the testicular (and other) dystrophies were due to the toxic substances produced by the dementia praecox *vis morbi*.

2. The clinical course of dementia præcox, a series of exacerbations and remissions, is similar to the exacerbations and remissions of such infectious diseases as the sleeping sickness, hookworm disease, tuberculosis, leprosy, trichinosis, and syphilis.

3. It has been shown by Todde[2] that the testicle of dementia præcox patients is devoid of living spermatozoa. This is also analogous to the condition of spermatogenesis in well-known infectious processes, such as pneumonia, erysipelas, typhoid fever, and cholera.

4. The eye symptoms in dementia præcox are similar to those in other toxic and taxi-infectious processes.[3]

5. Blood changes, physical, morphological, and chemical, are indicative of a profound toxemia,[4] especially the dehydration and the cyanosis are similar to analogous conditions known as methemoglobinemia and sulphemoglobinemia.

6. The skin symptoms, the circulatory disturbances of the extremities, the purpura, and the gangrene of extremities are similar to analogous conditions in rheumatism and other infectious processes and especially to those of chronic ergot poisoning.[5]

7. The adrenaline paradoxes of Willi Schmidt and Carl Neubürger,[6] are similar to reactions of the same kind in men or animals poisoned by full doses of ergot. These observations gave a hint of the character of the toxin for which to look in patients with dementia præcox.

8. Ergot of rye has been shown to owe its physiologic activity to twelve amines, some of them excessively toxic, others only mildly so. The most toxic contain the benzol, the indol, or the iminazol rings. The most toxic of all is

histamine, which contracts the uterus but lowers the blood pressure. The second in toxicity contracts the uterus slightly but raises the blood pressure. It is known as tyramine. The third in potency and the least toxic is indolethylamine.[7]

9. The blood pressure in dementia præcox is generally low, 100-80 or less. Therefore, if the adrenalin paradoxes are due to a previous toxemia with one of the toxins of ergot, then histamine seems to be the one toxine most likely to give rise to the dementia præcox picture.

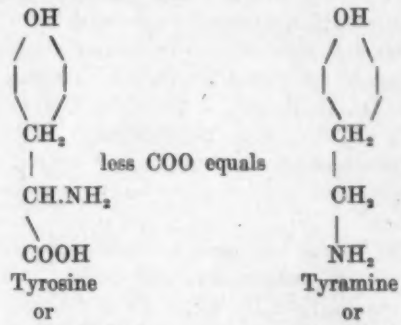
The toxic process in dementia præcox which we premise from the preceding postulates may be due to one or more toxins working in a direct or in an anaphylactic manner. If this process is infectious it may be due to a septicemic or saprophytic condition. Dr. B. Nadler was kind enough to make blood cultures from seven of the patients we studied, but none of the cultures showed any growth. In the literature there is no evidence of the recognition of a blood-borne microbe in this disease.

The adrenaline reactions and also the eye, the skin, and the blood pressure symptoms, suggest the possibility of poisoning by some toxic amine or by a number of toxic amines. This surmise is further activated by the fact that in epidemic ergotism more than one-fourth of those affected, especially the adolescents, present grave mental symptoms resembling dementia præcox.[8]

Although Ross,[9] of Kankakee, showed that indolethylamine was catabolized by dementia præcox patients in quantities four times as great as in the healthy, the fact that the blood pressure in most dementia præcox patients is low, suggested the possibility that histamine was the most potent toxic amine in dementia præcox. Dr. Julius Retinger found this amine in the stools of the patients but not in the stools of other patients, nor in those of healthy persons.

Granting for a moment that this venomous histamine is found in the stools of dementia præcox patients, it remained to determine why this amine was there and not in the stools of healthy persons.

The origin of many of the toxic amines is well known and tyramine is easily prepared by heating tyrosine in a partial vacuum at a temperature of 270° C. The process is represented by the following formula:



Tyrosine or p—oxyphenyl alpha amino propionic acid

Tyramine or p—oxyphenyl ethylamine or tyramine

Histamine on the other hand is prepared by submitting histidine to the action of one of the colon bacilli growing at a temperature of 37° C. under anærobic conditions for a period of five days. This particular microbe has been named *Bacillus aminophilus intestinalis*. B. & B.

Bertrand and Berthelot did not find the *Bacillus aminophilus intestinalis* in the stools of healthy persons. However, Mellanby found this bacillus in the colons of most men, of mammals, of birds, and of amphibia.[10] It did not therefore seem likely that the bacillus was specific and found only in the colons of dementia præcox patients. My equipment did not permit me to make examinations to determine this point. I assumed rather that the conditions were peculiar to those patients favoring their growth. We sought other causes for the presence of histamine in the stool.

It is remarkable how one finds a topic of dominant interest illumined by accidental experiences. We found that adrenaline had been used to relieve the pain of gastric crisis of tabes. Finding a patient with this condition at the County Hospital in the service of Dr. G. B. Hassin, we were allowed to try the remedy and study the patient. He was relieved instantly by the injection of 0.5 c.c. adrenaline 1:1000 (Parke, Davis & Co.) into the deltoid. This was repeated and in the stool Dr. Julius Retinger found the toxic amine, histamine.[11] When this patient came into the hospital a second time with gastric crisis, we again tried the adrenalin injection with equal success. At this time also the injection seemed to relieve some intestinal spasm and a whistling was heard in the abdomen of the pa-

tient as the exhausted patient went to sleep. The whistling and bubbling continued for fifty minutes until the patient awoke with pain.

This experience led me to study the motor efficiency of the alimentary tract in dementia præcox. Dr. E. Blaine, of the Cook County Hospital, and Dr. Max Hubeny have kindly lent me their assistance in studying this subject. The findings were revolutionary to our preconceived notions.

The barium test meal has now been given to more than twenty dementia præcox patients. The results upon the whole are as follows:

1. In only one stuporous patient did the tail of the meal fail to reach the cecum before the six-hour seance.[12]

2. In no case did the tail of the meal leave the cecum before the sixty-hour seance and in only two cases before the 120-hour seance. In three cases the test meal had not left the cecum at the end of ten days.

3. The meal did not lag in the distal colon or sigmoid, which were usually empty and well distended with gas.

4. The sphincter of Cannon was sharply marked in every case and was firmly contracted as in spasm. In two cases it was possible, by manipulation under the fluoroscope, to press small masses of the cecal contents through this sphincter as bacilli twice as long and the diameter of a three-grain capsule.[13]

5. That portion of the transverse colon between the hepatic flexure and the sphincter of Cannon harbored the tail of the barium meal for the longest time and in half the cases was shown by massage and fluoroscopy to be looped as if by hypertrophic activity.[14]

6. The cecum in three patients that have submitted to appendicostomy was found to be thickened, in one case to the thickness of the cheek.

Thus we find in the cecal delay abundant time for the development of the toxic amine, histamine, from the amino acid histidine, as the result of the growth of the *Bacillus aminophilus intestinalis.*

It still remains for us to show what arouses this spasm of the sphincter of Cannon.

We have elsewhere referred to the analogous spasm of the pylorus and the larynx in children which are believed to be allied to tetany or spasmophilia,—namely a calcium poverty of the blood. The calcium content of the blood in dementia præcox patients is still undetermined.

The appendicostomies which have been made were undertaken for obvious therapeutic reasons, namely, to positively accelerate the emptying of the cecum, but these openings have given approach to the contents of the cecum. Although we have not much to report, we have undertaken to determine the quantity of residue poured into the cecum after a standard meal, the proportion of dialyzable substance, its toxicity, its pressor power, and the relative proportions of the histidine, the tyrosine, and the tryptophane on its entrance into the cecum. This time-consuming work ought to be carried on with synchronous bacterial studies which are beyond our reach.

However, as clinical men, you will be most interested in the results of the three appendicostomies which were made more than eight weeks ago. All three boys are indubitable dementia præcox patients of less than three years' duration.

BEFORE IRRIGATION.

	Duration of the Disease.	Blood Pressure.	Abderhalden Reaction.	Weight.
Egan	2 years	80	++	82
Duggan	3 years	90	++	85
Hough	2 years	80	Not made	125

AFTER SIX WEEKS OF IRRIGATION.

Egan	....	118	++	130
Duggan	....	110	++	106
Hough	....	...	....	132

Thus far our researches have given evidences that cannot be questioned of the potency of cecal irrigation to raise the blood pressure to normal and encourage an increase of weight. The mental conditions are said to be improved, though such improvement is a matter of opinion only.

If, then, by direct toxemia from the venomous histamine some of the symptoms of dementia præcox can be explained, it is plainly indicated to us, and it should be felt as a duty, to still further pursue this significant lead.

1. The condition of the blood should be studied to determine the calcium and natrium content, and the basis of spasmophilia that might account in part for the spasm of Cannon's sphincter.

2. A group of dementia præcox patients with appendicular stomas should be placed on a measured diet and during the five-hour interval after each meal the cecum should be emptied with a Sprengel pump of all that passes the ileocecal

valve. Thus the presence or absence of the toxic amines in the ileum could be discovered in the dialyzate with the Dale apparatus even to 1 in 100,000,000 parts. It would also be possible to incubate the cecal contents and obtain the histamine in larger quantities. The separation and estimation of the several amino acids should also afford some further clues to the radically different symptomatic manifestations by different dementia præcox patients.

3. The effect of remedies taken by mouth upon the toxicity of the discharges from the ileum into the cecum could be studied in the same manner.

4. The action of the liver upon indolethylamine has already been demonstrated. The same cannot be said of the action of the liver on histamine. Allan Eustis' experiments with the buzzard liver are not conclusive, but they are very significant.[15] The fact that dogs tolerate large doses of histamine and that the theoretical product (urocanic acid) of histamine metabolism has been found in the urine of two dogs,[16] suggests that some use might be made of dogs' livers and dogs' blood serum in dementia præcox, and rational research might point out the way to do this.

5. That there is an anaphylaxis with so simple a toxin as histamine, our experience with asthma suggests. We may find at last that the relations between asthma, cyclic vomiting, and dementia præcox are etiologic, and our experience with one may guide us in the study and treatment of the others.

6. The alcoholic (Korsakoff) psychosis is probably dependent not on the ethyl alcohol, but on some contamination, possibly on some toxic substance manufactured in the body from the harmless ethyl molecule. So it may be with histamine. Its action on the brain may be due to yet unknown, secondary, toxic products.

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VACCINE THERAPY IN THE TREATMENT OF MODERN DISEASES.*

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1. The Essentials of Success in the Practice of Vaccine Therapy.

2. Summary of the Main Facts of Vaccine Therapy.

I. THE ESSENTIALS OF SUCCESS IN THE PRACTICE OF VACCINE THERAPY.

There are certain difficulties to be met in the practice of this branch of therapeutics, which are peculiar. They will beset the practitioner who takes up this study and it is very desirable for him to know them from the beginning and thus be able to surmount them successfully.

It is one of the purposes of this paper to dis-

*Read before the Ogle County Medical Society, May 8, 1915.

cuss these difficulties, and, if possible, be of some assistance in overcoming them.

The first great essential to success is to have the desire for research, the scientific mind. This mind has for its great essential characteristic the unquenchable desire to know. The practitioner who will succeed here must become master of all the facts now open to scientific medicine, especially those facts concerning immunity, which have been brought out since Koch discovered tuberculin. The attempt to set down these facts in their practical relation to vaccine therapeutics has been made in several excellent works on immunity by Wright, Ehrlich, Ricketts, Wolf-Eisner and others. These should be mastered by constant application to insure success in this work. Further than this, some of the conclusions arrived at here may be proven in the future not to be the facts by more careful research. We must, therefore, not consider our present knowledge as the last word on immunization, but have our minds open to new discoveries. We can only consider our present knowledge of this subject as fragmentary. Further, we must not start with the conclusion that the vaccines are cure-alls. We have not come to the day when the remedia sterilizans magna has been realized, but we are approaching very slowly that day. Our knowledge of physiology and pathology, cellular and intra-cellular, is so fragmentary that we are still groping in the dark. We may, however, use with care the knowledge already gained.

The use of the vaccines is almost universal on the part of the profession. Clinical evidence of their value is overwhelmingly convincing. The part of the up-to-date physician is to equip himself to understand their use. This can only be done by beginning now to examine every case which comes under his care bacteriologically. This will be a huge task for the average busy practitioner. He will need to equip his own laboratory. This task is assuredly not insurmountable and may be readily met by the progressive physician. It is assuredly being met by many of the splendid body of scientific research workers in America.

The busiest man will, of course, seek the bacteriologist expert as an assistant, but to succeed he himself must tread the well beaten path of getting acquainted with the bacteria. The next step is to begin at once to use the vaccines. That he may assure himself of their value, and not become discouraged at once, it is well to begin with acute infections. Many a man has given up the use of the vaccines after beginning with an old chronic case of infection, which, by repeated attacks, had already gotten into a state of chronic negative phase, because of the absorption of toxines from a large focus, open to the blood and lymph streams. Such cases have to be studied by the expert. The best way to begin is with a case of acute infection of the respiratory tract, say with a case of acute tonsillitis. Streptococcus vaccine, either polyvalent stock vaccine or autogenous, will usually act as a specific in these cases, and the severity of the attack will usually be over in 12 hours.

When one has adopted these methods of research and is already applying the vaccines in his practice, he may still fail of success for two reasons: First, because of the attitude of the ignorant members of the profession toward the use of vaccines. Second, because of the attitude of the people toward the use of vaccines.

The Opposition of the Profession. The attitude of the profession toward the use of vaccines has been more or less hostile up to the present time, but it has become a gradually retreating hostility under the stress of wide and successful clinical application. Ohlmacher told the story of the cure of a case of bladder infection in a physician having locomotor ataxia in 1906. The first case in which I applied them was also in that of a man over fifty years old, who had a chronic bladder infection caused by the typhoid bacillus. This case was cleared up very remarkably under twelve inoculations with the autovaccine.

The mental effect of this case was certainly enough to convince the most skeptical, as I had started with one of the worst cases with which we meet. This case was reported at the Macoupin County Medical Society, in 1906, in my first paper on vaccines. This encouraged me to try the vaccine on my own chronic nasal catarrh and follicular tonsillitis. A like good result made me certain that there was no danger in the use of the vaccines, and I began to use them freely on my patients. Ten years of their constant use, during which I have given thousands of inoculations, sometimes more than 100 a week, has increasingly convinced me of their value. The knowledge thus gained has become invaluable in the treatment of disease.

The question which will arise as a bogey to the average physician is: *Are the vaccines dangerous?* My answer to this question is: I have never seen a death which could honestly be attributed to their use, with the one exception of the unwise use of tuberculin. The best answer to this question is: *The vaccines are not dangerous, if used with the same degree of knowledge and care which physicians apply to the use of other remedies which are toxic in character.* We must not lose sight of the fact that the old heat-killed type of vaccines are toxins. They contain toxins of the germs which cause the infection. We may avoid even the use of a minimum of toxic substance by using the non-toxic vaccines. We must learn to use them with knowledge and circumspection.

The Opposition of the Public. The fear of the injection of serum or vaccine has been largely broken down by the success of diphtheria antitoxin. There is still that aversion to the use of the needle, but that also will wear away, when the cure of those cases which resist other methods is assured by the actual knowledge that it is possible.

Often have I had sent me a case of chronic infection by a fellow practitioner which he had failed to cure by the usual methods. At one time I had two such cases referred me by Dr. W. H. Bohart, at Englewood Hospital in Chicago. One was a case of ferunculosis, with a continuous crop of 180 boils. This was cured by five inoculations. The next case was one of chronic burrowing abscess of the leg, posterior to the knee. This was cured and healed completely under twelve inoculations, in spite of the fact that he had been under the care of one of the best surgeons, and in the hospital ninety days prior to the use of the vaccine. Another case came to my notice recently, which shows very graphically both the attitude of the laity and the average physician to this kind of treatment, until convinced by actual trial.

A friend inquired with reference to the treatment of rheumatoid arthritis with vaccines. I replied that I had recently seen Rosenow, and that he reported some favorable results in these cases by isolating the etiologic bacteria from the lymph glands in close proximity to the joints. I said that the mouth and throat should be examined and a vaccine from any foci located there tried out, to see if it would help.

My friend said he would see his friend and ask him to try it. He did so, and even offered to stand the expense of the vaccine and five treatments, if his friend would try. The friend at once consulted his wife, who dissuaded him from doing so, and advised him to keep on with his regular medical treatment, his family physician advising the same. He lost weight, went down, became anemic. Normal weight 186, now 138 lbs. He went to Florida, and from physician to physician. He finally went to Mudlavia. Light treatment, x-rays and baking the swollen joints, were all tried to no avail.

He had the mud baths at Mudlavia and during his stay there he contracted a cold and a cough. The attendant was a young physician who was then treating a series of cases of whooping cough with a vaccine. He said you may have whooping cough. I will give you a dose of whooping cough vaccine, and he did, but the cough was not any better. Then he said, I will get a culture from your throat and send it to the Chicago Laboratory for an autogenous vaccine, which was done.

This vaccine was used for 5 doses and the patient lost his cough, improved in strength, gained in weight; but there was no improvement in the general condition after that, in fact, he did not seem to be quite so well. So the physician said, I believe there is trouble with your teeth, after examining the mouth he advised that an x-ray be taken to determine any trouble there. This was done. Three abscesses were found. The teeth were removed and the man regained his health. He now weighs 175 lbs., nearly normal weight. Still some stiffness in the joints, but he is practically a well man, except for the deformity caused by the disease. Both the physician in charge at Mudlavia and the wife of this man afterward stated that the harmful effects of the disease might have been avoided by early use of the vaccine.

The prejudice against vaccine treatment is broken down by actual success in such cases as this.

Honest progress will establish its value in overcoming infections, if the work is done carefully and efficiently.

One case of rheumatism cured in a community makes certain the call from the many who suffer. My greatest successes have been in rheumatism, neuritis, tonsillitis, gonorrheal rheumatism and nasal infections, with infections of the middle ear closely following.

There is one other drawback to the practice of vaccine therapy, and that is that it does not harmonize with the ancient practice of dosing at regular intervals, to which the people have become used, both by teaching of the physician and the druggist. The crusade against patent medicines and secret remedies, and the more general information of the public, as to the dangers of the drugging habit, is gradually breaking down

this tendency. The researches of Ehrlich, which lead toward the actual remedy which will kill the parasite, using the remedy only in such doses as do not work harm to tissue cells, is another factor which tends to prevent the unintelligent use of remedies. The day of empirical medicine is passing, and will pass when the public becomes informed as to these advanced steps in therapeutics. These difficulties are being met by the education of both profession and public.

The value of the vaccine is being proven by daily use. Extravagant claims are being set aside, and vaccines will ultimately find their proper place in the prevention and cure of disease. The people are being won to their use by the actual results obtained. *Not a single issue of any reputable medical journal has appeared during the past five years, which has not declared the vaccines valuable in some new field.*

Many a case will appeal to the immunologist, in which infection is latent. Often swollen glands will respond to the use of the stock streptococcus or staphylococcus vaccine, when no germs may be obtained from an original focus, which has already closed.

Puncture wounds also frequently baffle us, when we are sure the streptococcus has entered, from the red streak, which shows the course of the infection up to the arm or leg. In such a case it is well to inoculate with a polyvalent streptococcus vaccine at once. This was done in a case of puncture of the foot in a man past fifty years of age. The foot had been punctured the day previous, by a carpet tack. The tack passed through a soiled stocking, and the wound closed in a short time. When I saw it the foot was swollen, and very painful. The swelling was localized in the plantar space, beneath the fascia. There seemed to be no great extension or streaks of lymphangitis. I therefore concluded that there was an infection with the staphylococcus. One large dose of staphylococci, 250 million, caused the rapid recession of the inflammation. The wound opened, but no pus found. *A rapidly developing adenitis in any part of the body should be treated at once by a prophylactic dose of the vaccine containing staphylococci or streptococci.* In case this fails, it may be necessary to puncture the glands, and obtain some of the lymph for culture, but such efforts often fail to give the cocci, since the puncture brings fresh blood, which quickly kills the few cocci obtained.

The repeated use of the pus cocci vaccine will usually be effectual in such cases. Culture from any neighboring suspected foci must not be neglected. We may best sum up by saying that vaccine mixed with gray matter is successful in combating infection and saving life, but vaccine minus gray matter is worse than useless; for, used improperly, they act as poisons and lower the resistance to the invading bacteria, thus aiding in the spread of the very harmful effects which we are trying to combat. Efficient knowledge, gained through instruction of the highest type, is necessary that the profession may do this work intelligently. It should not be left to the commercial houses, the experimenters and the quacks. The medical schools must provide instruction in clinical vaccine therapeutics.

2. SUMMARY OF THE MAIN FACTS OF SPECIFIC THERAPY.

Specific therapy is the application of remedial measures which actually cause the death of the specific agent causing the disease. Quinine, salvarsan and mercury are specific remedies, since they are known to destroy animal parasites, amebae, spirochaetae and bacteria in vivo. The present trend is to fix the value of every remedy employed as to its power to destroy the infecting agent, without harming the body cells. Even more than this is found in these remedies, for they even stimulate protective processes. The well-known power of quinine and arsenic to stimulate leucocytosis is evidently one of the most potent factors in making these remedies effective.

There are not many diseases which are still outside the field of specific therapy. Cancer still resists every attack. The causal agents of measles and yellow fever are still unknown, and these diseases have not thus far been successfully prevented and treated by specific agents, but they, too, are no doubt of bacterial origin.

Recently, cows have been infected by measles and soon we may be able to include it with other diseases in which we know the cause. The infective agents which have been successfully combated by specific therapy are the staphylococcus, streptococcus, B. diphtheria, B. tuberculosis, the glanders bacillus, the gonococcus,

diplococcus intracellularis meningitis, micrococcus catarrhalis, B. Friedlander, B. coli, and the whole intestinal group, including B. typhosis, dysenteriæ and plague. Even leprosy is now being successfully treated by bacterial products. Diplococcus rheumaticus has now also been identified and is effective in a vaccine, B. Epilepticus as well.

Those diseases in which the causal agents are still unknown or disputed, but which are successfully treated by specific agents, are scarlet fever, eczema, pertussis and infantile spinal paralysis. No attempt here is made to have this classification exhaustive, since the status of beri beri as an infection is in doubt, and the parasitic blood diseases from filaria, sleeping-sickness, hook-worm and trichinæ are not included, nor are the infections due to streptothricæ or actinomyces included.

Nearly all these lower animal and vegetable forms secrete or excrete exotoxins, or substances now known as aggressins, which are poisonous to human cells and secretions. Others still produce substances known as endo-toxins, which are inside the bacterial body and only seem to be liberated upon their solution or lysis. Such are the various cocci. Certain bacilli form large doses of soluble toxins, such as B. diphtheriæ and tetani. Certain bacilli of the intestinal group produce toxins, but not so freely soluble, but liberated, both during the life of the bacilli, into the blood and lymph streams, and also more freely at their lysis, which seems to occur freely during the disease, such as B. coli, B. plague, B. dysentery and B. typhosis. In opposition to these various toxins, the cells and blood forming organs, bone marrow, lymph glands and splen, all, aid in the formation of antitoxins for toxins and bacteriolysins for the bacteria which undergo lysis. These include all known species, when they are affected by their specific antigen, and the proper amount of complement is present in lymph and blood serum. These same also form agglutins, and the pus forming group, form opsonins, which make them phagocytable. Passive immunity may be brought about by the normal action of all these resisting forces against these invading forces. Active immunity is sought by the use of the various antibacterial sera and vaccines.

The elaborate standardization of tuberculin is very necessary, on account of its extreme toxicity. The serum for diphtheria and tetanus have been brought to such a high state of dependableness that the confidence of everyone has been secured. Not so with the various tuberculins. An international board of standardization of these products would be very desirable, and will, no doubt, be realized, since tuberculin has been in the hands of the charlatans. Bactericidal sera have not proven dependable, since, as Wright says, they are but dilutions of bacteria by animal serum, and cannot be properly standardized. Bacterial vaccines are dependable antigens. They can be standardized and are valuable agents for the destruction of bacteria. Care must be taken in their use, not to overdose, or to give them at improper intervals, thus flooding the body fluids with harmful overdoses of bacterial toxins, which are liberated at the lysis of the bacteria thus destroyed. The non-toxic form of bacterial vaccine will aid in the more accurate control of the destruction of the invading micro-organisms, with less toxemia and more rapid immunization. This danger may be also overcome by care in watching symptoms and the use of serum tests and blood examinations, including estimations of leucocytosis and the opsonic index and the use of small, properly spaced doses of the vaccine.

The various immune sera have been successfully administered subcutaneously, intravenously and per rectum. They are useless by the mouth, since they are almost entirely digested in the stomach. The best method is by subcutaneous injection, though in some grave cases the intravenous route may save life, as absorption is immediate. The bacterial vaccines have been successfully administered by the subcutaneous route, intramuscularly and by mouth. The intravenous method is more rapid and accurate.

It has been demonstrated that some of the antibodies are elaborated in the lymph glands and spleen. It will be found more effective when using the vaccine hypodermically to seek the vicinity of the lymph glands, when injecting the antigen. It is a valuable procedure to at least inject the antigen in the lymph stream which bathes the infected part. Certain unfavorable reactions may take place as the result of the injection of antigens. These have been called allergic or anaphylactic reactions and serum sickness, since they were first recognized after a second injection of antitoxic serum. When the reaction period from the initial injection is com-

plete, a second injection causes partial digestion of bacterial proteid and produces allergy. Care is necessary to give the antigen before the high tide of immunization from the first dose has been completed. This is done by giving the doses of antigen, at the height of, or just before the high tide of antibodies is reached from the former dose. *Do not allow a period of fourteen days to pass after injecting any antigen.*

The cells of the animal body are all sensitive or irritable to outside stimuli or toxins. It is this property which makes immunity possible. The direct local effect of the administration of an antigen is, that the cells surrounding the point of the inoculation are stimulated to a high state of irritability or local allergy. They soon recover, however, since other living cells come to their aid. A few local cells may die, but the remainder are stimulated to an overproduction of substances which we now call antibodies.

These substances have been investigated and some few of their properties are now known. Agglutinins for some bacteria are formed. They cause the bacteria to adhere and hamper their growth, but do not seem to kill them. Agglutination seems to be a preliminary process to further the lysis of the bacteria. It is very like the extrusion of a part of their protoplasm through the ectosarc; the ectosarc itself being finally destroyed by the completion of the lytic process. The extruded substance is gummy and causes the bacteria to adhere. But there is also the action and inter-action of antibody, amboceptor and complement involved in this process, and agglutination seems to be an accompanying phenomenon. Opsonin is another of these antibodies, the function of which is to prepare the bacteria for phagocytosis. The complete lysis, similar to digestion, is completed in the bodies of the phagocyting cells. The necessary ferment is present in the phagocyting cells. The complement necessary for this lysis seems also to be supplied by the blood serum, but some assign this function also to the leucocytes.

In case of the intestinal group of bacilli this lysis occurs very rapidly in the serum itself, upon the introduction of the antigen. This latter has been demonstrated by injecting the B. typhosis in the peritoneal cavity of the guinea pig, and following this up, after multiplication of the bacilli, by a dose of the antigen. The lysis of the pus forming organisms, bacilli of the diphtheria group (like B. tuberculosis, proteus, pseudo-diphtheria and bacillus diphtheria itself), takes place with greater difficulty, because of a more resistant ectosarc, and, therefore, requires the digestive intermediary of the living leucocytes. It is thus known that the immediate effect of the injection of any antigen is a large overproduction of these protective substances which cause bacteriolysis. The after effect which develops during the excursion of the reaction is the flooding of the blood and lymph streams with this excess of antibodies. Now, when these antibodies reach the original focus, in which there are hosts of the infecting bacteria, the result is the lysis of great numbers of these bacteria, and a corresponding increase in the output of antibodies. This process is continued until all the invading bacteria are destroyed by digestion. Repeated doses of the antigen aid in the completion of this process, up to a certain point, beyond which we may not go without the danger of exhausting the power of the cells to produce antibodies.

The perfect aim is the complete digestion of the invading bacteria. Imperfect digestion means toxemia and continued infection. A perfect result will be obtained by the opportune injection of the vaccines, to stimulate this digestive process to completion. The use of immune sera and vaccines as prophylactics in diphtheria, tetanus, typhoid and scarlet fever is now a valuable aid in reducing the number of these infections and cutting down their mortality. The use of the vaccines in limiting the progress, and even prior to the inception of infection in wounds and punctures, is a valuable aid in preventing the spread of these infections. Septicemia after wound infection should be made impossible by their wise use. The use of vaccines to prevent colds and their sequalae in bronchitis and pneumonia, will aid much in limiting the evil effects of these infections.

We do not hesitate to maintain also that the use of the vaccine against those acute infections of the respiratory tract will materially reduce the death rate from pneumonia; for nearly all these cases terminate either in bronchitis, bronchi-pneumonia, or lobar pneumonia. The reinfection or persistence of the pneumococcus in any part of the respiratory tract predisposes to pneumonia. The use of the vaccine is the only

reliable method at our disposal for destroying the pneumococcus in these surface infections of the mouth, nose, throat, ears, larynx, trachea, bronchi and alveoli. Let the profession avail itself of this weapon with the purpose of cutting the death rate from respiratory infections. Tonsillitis, both acute and of the recurrent variety, can be prevented by using the corresponding vaccine. *Every dose of antigen used properly raises the serum content in antibodies and increases resistance.*

The streptococcus, staphylococcus and M. catarrhalis will be found in most of these infections. It will be best to establish an immunity to all three, as infection with these bacteria is most common. School children are best immunized by administering several doses of such vaccine at 5-day intervals, so as to prevent epidemics due to infection by these germs.

Gonorrheal rheumatism may be prevented from developing, after acute, sub-acute gonorrhea, and in gleet, by administering immunizing doses of the vaccines at 10-day intervals. Typhoid fever is now effectively prevented by inoculating with 500 million typhoid vaccine, in three inoculations, at 10-day intervals. It will become universal as a preventive of typhoid epidemics in all cities, and in all congestion of population. Non-toxic typhoid vaccine is curative of the disease when used intravenously.

There is still room for accurate research in this therapeutics. Enthusiasm is necessary, but it should be tempered with wisdom in judging results. The vaccines will often fail, when the nature of the infection is unknown and the extent of the focus obscure, because of the too rapid absorptions of toxins, which rapidly poison the higher nerve centers, thus bringing on rapid dissolution, but care in studying such cases will often bring victory.

The treatment of such chronic skin infections as acne and eczema should be studied carefully, as such cases usually require at least a year of the most painstaking effort, and a perfect understanding of the problems of immunity.

It is well to remember that no two cases react exactly alike to any one antigen; that is, the constitutional element or natural resistance in every case is a variable element. It is undetermined at the start, and we must determine, if possible, what it is, by feeling our way, in the use of every antigen. This may be accomplished by employing small doses at first. We may gradually increase them to the point of tolerance, if need be, to produce a maximum of antibodies, and by flooding the foci eradicate the infection. The aim in writing down in the works on vaccine therapeutics the doses given has been to give the average dose, but this, it must not be assumed, is at all arbitrary, for the intention is to give an approximate idea as a guide in the individual case.

It may even be found that the dosage will vary widely from that given in certain cases. We have on record a case of mixed gonococcus and streptococcus, pelvic peritonitis, in which doses of the mixed vaccine of 5 billion cocci were necessary to produce complete recession of the infection.

We must, however, adopt some standard, and these dose tables are attempts to arrive at such a standard of dosage for the vaccines. The wise will use them only as guides. Supplementary investigations will improve this standard, and the results of the many who use the vaccines will be added from time to time. As our knowledge of the response of the human system to the various antigens becomes more perfect, we may expect more reliable guides. The knowledge of the etiologic agents themselves is still incomplete, the strength of toxin varies with the virulence, and the virulence varies according to the recency and frequency of passage, and according to the soil of the individuals through which it has been passed. This forces us to always employ the autogenous vaccine, using stock only as a prophylactic, till autogenous is ready.

New etiologic agents will also be discovered and new infections overcome, as careful research work finds its rewards, and these will also be recorded in the future.

The dose of the vaccine is not the dangerous factor; for the patient is, in every case in which infection actually exists, already absorbing toxins of an amount far greater from the focus, than could possibly be administered in huge doses of the vaccine. A greater number of bacteria by billions are generated alive from the focus hourly than is ever given, even in many doses of the vaccine. This is the reason that great variations in dosage in practice have never been followed by any bad results. In the first experiments with typhoid vaccine, Wright himself advocated the injection of an entire culture of typhoid bacilli, and with no bad results, save a very

severe reaction, but more permanent immunity for the patient. *The interval of administration is the important consideration. Administer the vaccine only at the intervals of improvement.*

The fact that the various bacteria vary much in virulence will require that in each case the initial inoculation be small, in order to determine the toxicity of the vaccine. The toxicity will also vary much with the method of preparation, whether killed by heat or antiseptics. The newer method of preparation by the use of digestive agents will eliminate excess toxins, and the dose of the non-toxic vaccine may be correspondingly increased. The condition of the serum of the patient in various prolonged infections may make a cure with vaccines difficult or impossible. Complement for the invading bacteria may be exhausted or completely lacking. Certain bacilli are natural agglutinators, typhoid, colon, dysentery, cholera, glanders, pyocyaneus and B. enterides are in this group. Certain cocci and bacilli are now known as forced agglutinators; staphylococci, M. catarrhalis, gonococci, B. diphtheriæ, and B. tuberculosis are in this group. Certain others have not been demonstrated to form any agglutins in the human system. They are Friedlander's bacillus and B. xerosis. This ability to form agglutinins seems to depend on the variations in the thickness and in the character of the bacterial ectosarc. The variations in the number of natural and immune antibodies in the serum of different individuals will also be a factor which will determine the variation in the severity of reaction to the vaccine. So that it will be readily deduced from what has been said, that each patient must be investigated separately as to his power to resist toxins of his infecting bacteria. No more important problem in therapeutics exists than this. It often calls forth the best energies of the immunizator in painstaking research to finally solve it.

BRIEF SUMMARY OF RESEARCHES CARRIED OUT DURING THE PAST YEAR.

Non-Toxic Bacterins. We have carried on continued experimental work during the past year with the purpose of obtaining more perfect bacterial vaccines, and with success. The first work was done with the staphylococcus, and we prepared vaccines from both kinds of staphylococci, which we were able to use directly into the venous circulation and in doses as large as 5,000,000,000 cocci. The report of this work has been given in the August, 1916, number of the *Chicago Medical Recorder.* Later we experimented with all the common pathogens, including the streptococcus, pneumococcus, gonococcus and micrococcus catarrhalis, and the pathogenic bacilli. We found that by similar manipulations to those used in removing the toxins from the staphylococci, we were able also to remove them from these bacteria, and to prepare more effective vaccines. We have reserved detailed reports of these experiments for future papers.

Tuberculosis. We are now testing out the same process on the tubercle bacillus, and are using a new non-toxic tuberculin, which we call N. T., with favorable results. We shall also reserve the detailed reports on this preparation until the clinical tests are complete. At the present time this tuberculin is being used in different types of tuberculosis, with progressive improvement. The inoculations are made intravenously.

Asthma and Hay Fever. During the past hay fever season we prepared an anti-pollen vaccine to which we added a new coccus, found often in these hay fever cases, and we found this combination to be successful in aborting every case of hay fever in which it has been tried. Asthma has yielded a new etiologic agent, which we are now using in a vaccine and with markedly beneficial results. The detailed report of the isolation and experimentation with this organism must necessarily be given in a future paper. Thus far we have treated the different types of asthma by the intravenous inoculation of 25,000,000 of the organism in a vaccine. The acute attack responds at once by amelioration. The difficult respiration and wheezing ceases within twelve hours. This organism is also found in bronchitis and in one type of ulceration of the larynx. The use of the vaccine in bronchitis clears the bronchi of this organism and stops the attack. In nephritic asthma the organism is found in the urine, even the large granular casts contain nests of the organism. One case of nephritic asthma has been rapidly relieved with apparent cure, by using the vaccine from this organism, found in the urine. Further study of this organism will determine its etiologic relation, but the results thus far obtained are very interesting.

Lues. Having succeeded in the preparing of vaccines which are less toxic and more effective

in the many acute infections, and with some suggestion of success in the use of a new tuberculin of this type, it occurred to me that it would be advisable to test out the effect of the Spirochæta pallida in a vaccine. With the same method of procedure we have prepared luein. The Spirochæta pallida certainly produces antibodies, and the resistance of the tissues to this organism is marked, hence the logic of the use of such a vaccine is just the same as that for the use of a tuberculin. This product has not and must not be used in any case, unless it is that of demonstrable syphilis, both by Wassermann test and by positive lesions and symptoms. The product is sterile, non-toxic luein, and is used intravenously. We have used it with benefit in cases of chronic syphilis. It may also be used for diagnostic purposes by hypodermic injection, and produces a similar lesion to that of luetin when so used. No severe reaction follows its use in specific cases, save a slight rise in temperature of one to two degrees and general malaise. Relief from severe pleuritic pain and gradual improvement was obtained in a case of syphilitic pleurisy with beginning ataxia. Further investigation as to the immediate effect of the use of this preparation in the various stages of the disease will determine its value and be reported later.

Ozena. During the past year Perez of Vienna reported a bacillus of a new type in ozena. Vaccines were obtained by American physicians from him and reported successful in the cure of ozena caused by this bacillus, in a 1916 issue of the *Journal A. M. A.* We have repeatedly isolated this bacillus in ozena. It produces the characteristic stinking odor always present in ozena, when grown in proper media. The use of a vaccine prepared from this cocco-bacillus has proven valuable in a series of cases of ozena inoculated with this vaccine during the past year.

Rheumatoid Arthritis. In 1914, Rosenow told me that he had isolated organisms from the lymph glands in close proximity to the joints in rheumatoid arthritis. We have since investigated every case of joint involvement as to infection found in the tonsils and alveolar abscesses. In all cases thus far treated we have isolated the Gram-negative diplococcus rheumaticus in true rheumatism and the bacillus of Schultze in rheumatoid arthritis. Two cases of this affection are now under my care. One has responded by complete relief from all joint involvement. In this case there was marked involvement of the cervical vertebræ, and there was limitation of the movements of the neck, as well as the usual spindle formation about the finger joints. All this has disappeared under intravenous inoculation of a non-toxic vaccine of the Schultze bacillus. The second case is more acute, with marked stiffening and deformity of the finger joints. Reaction and soreness about these joints follows each inoculation and there is progressive improvement. Our experience thus far proves the value of the new type non-toxic vaccines.

209 South State Street.

SYMPTOMS AND DIAGNOSIS OF INFANTILE PARALYSIS.*

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ROCHELLE, ILLINOIS.

During the period from July 1 to September 23, there were 648 cases of acute poliomyelitis reported to and verified by the Illinois State Board of Health. There was about 11 per cent mortality. In many respects, the morbidity iself is more to be dreaded than the actual death rate. Epidemiologists and public health authorities, guided by past experience and the laws of epidemics, anticipate an outbreak next summer which may well assume larger proportions than the recent one that has been stayed by the advent of cold weather. With this outlook it behooves us to keep an ear to the ground, as it were, to familiarize ourselves, as well as may be, with the many and diverse manifestations of this stealthy disease, whose symptoms may be as variable as the functions of the cerebro-spinal axis.

Now, I do not presume to add anything to the sum total of knowledge of the symptomatology and diagnosis of acute poliomelitis, but wish merely that we might review together the outstanding features of this malady and to this end recite a few notes on a case recently under my observation, which in many respects was typical. Let me say, in passing, that we must avoid being dogmatic and avoid using the term, typical, in a narrow, restricted sense and to bear in mind that while the essential and enduring pathology

*Read before the Ogle County Medical Society at Rochelle, Oct. 18, 1916.

is in motor neurons of the anterior horn, the brain and cord together with their coverings may share, in a measure, the onslaught of the disease. Hence the extensive array of symptoms; the multiplicity of types, viz., abortive, common poliomyletic, meningeal, cerebral, bulbar, polyneuritic, etc., with all shades and gradations.

Any intelligent conception of the phenomena presented and indications in a given case must be based on a correlation of the underlying pathology and resultant disturbance or absence of function. The symptoms will perforce vary according to location and degree of pathological process. Any stereotyped description cannot, of course, embrace but part of the symptoms presented in a given case. It follows that there may be much confusion and difficulty in the diagnosis of many cases and this has important bearings on the prophylaxis and control of the disease. The infected child, who is so fortunate as to present but few symptoms, and in an ameliorated form, is a greater menace to society than his less fortunate fellow-sufferer.

The following is a synopsis of the case referred to: W. Y., male, American, aged 22 years, single, no definite occupation, has been a "knight of the road" the past four years; well nourished, intelligent. Had neuritis (?) three years ago, attributed to exposure to cold while pursuing his regular vocation; prompt and complete recovery in two or three weeks. Denies syphilitic infection, has not had gonorrhea. Had tonsillitis (acute follicular) six weeks previous to present illness, sick three or four days; had been working at this time, illness necessitating loss of two days, recovery complete. Will say, however, that tonsils at that time showed changes of chronic hypertrophic tonsillitis, enlarged crypts, etc. Says he never had similar trouble before. Family history negative, except that mother died of tuberculosis.

Present Illness: Came to Rochelle from Chicago, July 16; came to my office the evening of the 17th. Says he has not been feeling well the past three days, thinks he has rheumatism; left leg feels lame and is painful, back aches, head aches severely, especially in occiput and back of neck. Upon bending neck says "it feels as if it would break"; throat feels sore. Pharynx and tonsils are injected; head feels "stuffed up"; there are no patches in throat. Temperature 101, pulse 96. Patient does not seem very ill. In view of recent history of tonsillitis and present sore throat make tentative diagnosis of rheumatic fever: general intoxication prior to localization of disease in joints. Patient is told to report next day. Following morning patient is brought to my residence, being unable to walk, left leg completely paralyzed, left patellar reflex lost, slight response in right, tenderness and pain on movement; muscles are sensitive to pressure. Does not complain of throat today; headache and lameness in neck continues; seems apathetic; temperature 100.5. Diagnosis of acute poliomyelitis is made. Dr. Chandler of Rochelle concurs in diagnosis.

Later in the day right leg becomes paralyzed; pain increases; notice fibrillary twitching of lips; elicit same in muscles of thigh by slight pinching. Hyperesthesia becomes marked. Spine is tender. On evening of this day, July 18, patient is unable to urinate; catheterization causes exquisite pain. Soft gum catheter of medium calibre is passed without resistance, however. Vomited during night.

The hyperesthesia increases during the next day and succeeding days. Says the horses scampering in the pasture adjacent seem bent on annoying him. Attendant must move about very cautiously, else patient complains sorely of his distress. Despite the fact that place of isolation is remote from railroad 2 or 3 blocks, he seemed to have an uncanny presentiment of approaching trains; says he can feel them before he can hear them.

Passage of catheter causes intense suffering, crying aloud, even when greatest care is exercised. Preliminary instillation with cocaine as a regular procedure is unavoidable. Urine dribbles very slowly from catheter unless pressure is exerted with hand on abdomen. Bowels do not move without an enema or other artificial aid, patient being unable to aid with auxiliary muscles. Morphin hypodermically, repeated two or three times a day, is indicated for pain.

Third day of paralysis, complains of some pain in arms, is unable to grasp my hand firmly, action of biceps easily resisted. Due to the weakness in arms, direct feeding is necessary.

Fourth day of paralysis, breathing becomes accelerated, superficial but regular, says he cannot cough or sneeze, clears throat with difficulty, swallowing of solids or liquids not interfered with. Teeth are very sensitive. Striking teeth together causes sharp pain. Temperature sense is accentuated; complains acutely if heat is applied, yet he suffers more during night—attributes this to lowering of temperature.

Mild, transitory delirium, with hallucinations, during fourth and fifth days, temperature not high, however, 102.5 being maximum noted. Temperature persists until seventh day of paralysis. Paralysis of bladder disappears on the eighth day. On the twelfth day, complains of sore throat; swallowing is difficult. Tonsils are markedly swollen and inflamed. There is a gradual abatement of hyperesthesia, except in lower extremities, which necessitates exhibition of opiates at intervals until the sixteenth day. At the end of quarantine period, which coincides with period of observation, there was a total paralysis of both lower extremities, except slight motion of great toe of the right foot; this motion was at no time abolished. There was quite noticeable atrophy of lower extremities; this atrophy appeared symmetrical; upper extremities were normal.

This case is interesting and instructive, in that all the cardinal symptoms of the so-called

typical case were present and, the patient being an intelligent adult, we were able to note the subjective as well as the objective symptoms. It, as you know, is difficult to interpret the experiences of the infant sufferer.

The marked hyperesthesia and pain, in this case, we might well interpret as an expression of posterior cornuae. The presence of pain at such high level of cord, the peculiar sensibility to vibration noted, together with the mental symptoms, would best be explained, in my opinion, by an inflammation of the meninges with increased subdural pressure.

Diagnosis: There is, of course, during the onset of acute poliomelitis, the usual symptoms common to any acute infection: malaise, chills and fever, rapid pulse and respiration, loss of appetite, nausea and vomiting; diarrhea is often present.

The outstanding features of this disease are, in a child, irritability and fretfulness, drowsiness, evident tenderness upon being handled, sore throat, severe headache, especially in occiput, pain and stiffness in neck, backache, followed by flaccid paralysis of one or more extremities, loss of reflex, patellar, cremasteric and abdominal; inability to urinate, loss of response to faradism, constitute a complete picture of a "typical case." The spinal fluid may become turbid, Noguchi's reaction together with lymphyocytosis may be of value; leucopenia is present as a rule. Fibrillary twitching bespeaks anterior horn lesion, tenderness in the spine is an important diagnostic symptom.

Acute poliomyelitis may be confused with peripheral neuritis, especially post diphtheretic, as in case cited; Landry's paralysis; cerebro-spinal meningitis, meningitis due to other toximias, as acute gastroentritis, rheumatism anr rickets may resemble many aspects of this disease. Infantile paralysis, let me repeat, "obeys no formulae;" while there is a predilection for children during first detention, no period of life is exempt. During the past epidemic, in this state, there was a large number of adults attacked, the oldest being forty-two years of age, and who, by the way, succumbed to the disease. In Switzerland, during the past summer, adults paid a heavy toll to the scourge, the onset being acute and frequently followed by a progressive, ascending paralysis, as in Landry's paralysis.

Let us admit that the diagnosis prior to or in the absence of paralysis is, as yet, well nigh if not quite impossible.

A REPORT OF AN EPIDEMIC OF TYPHOID FEVER.*

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PARK RIDGE, ILLINOIS.

General Considerations. Park Ridge is situated at the northwest corner and just outside the Chicago city limits. The Des Plaines river, into which the city drains, lies about one mile to the westward. The populations as reported by the United States census bueran have been as follows:

Year	Population	Per Cent Increase
1890	987	....
1900	1,340	35.8
1910	2,009	49.9

The population at the present time is estimated to be slightly over 3,000.

The city is primarily residential and essentially a part of Chicago. Transportation facilities are provided by the Chicago & North Western Railroad. There are no factories. A cleanly and well-kept appearance is presented; the streets are, for the greater part, well paved and good drainage is provided.

An area of about two square miles is included within the corporation limits. Elevations within this area range between about 635 and 665 above sea level or about 55 to 85 feet above the level of Lake Michigan. The elevation of the Des Plaines river bed west of the city is approximately 615 or 20 feet below the lowest part of the city.

The drift covering in this section is mostly of till and about 105 feet thick. Shallow wells 8 to 15 feet deep formerly yielded a plentiful supply of water for general household use, but the installation of a sewerage system has served to drain such wells.

Water Supply and Sewerage. Adequate water supply and sewerage systems are the two most valuable assets a city can have from the standpoint of health, and, therefore, a brief statement of the systems at Park Ridge will be given here.

Water Supply. A public water supply was installed in 1890 and is now practically universally used throughout the city. The water is pumped

*Read before the scientific meeting of the staff of the Sheridan Park Hospital, Chicago, Nov. 28, 1916.

directly into the distribution system from two wells 1,425 and 1,806 feet deep, respectively. Connected with the distribution system is an elevated tank affording a pressure range about the city of 40 to 55 pounds.

The wells are adequately cased and protected and the method of pumping and distributing the water precludes contamination. Analyses of the water made in the laboratories of the State Water Survey show it to be of excellent sanitary quality and very satisfactory for general domestic use.

Sewerage. The city is provided with a combined system of sewers covering practically the entire built-up area. There are two outlets to the Des Plaines river. Only a few houses that can connect with the system have not yet done so and in these instances privies are still in use.

Typhoid Previous to Present Outbreak. Park Ridge previous to this outbreak of typhoid fever had been practically free from that disease. During the fall and winter, up to the time the outbreak started, no cases of typhoid had occurred. Other contagious and infectious diseases had been of comparatively rare occurrence and the city had been considered a clean and desirable residential community.

Present Typhoid Fever Outbreak. As a part of the investigation, a personal visit was made to all the houses having cases and detail information regarding each case obtained. This information, which is made use of in the following paragraphs, is given in detail at the end of the main report.

Magnitude and Duration. There occurred in all, twenty-eight cases during forty-four days, from January 9 to February 21. Since the latter date and up to the end of the investigation or present time, no new cases occurred. None died.

Geographical Distribution of Cases. The cases were not confined to any one section of the city. Fourteen and ten cases, respectively, were north and south of the railroad tracks which divide the city centrally. Four cases occurred outside the city limits. A point which bears mentioning is that generally the cases occurred in the better class of residences.

The deduction made from the geographical distribution of cases is that either the agent of infection had been active throughout the city or that the persons affected had met in common and at such times been exposed to the disease.

Distribution of Cases According to Families, Ages and Sex. The 28 cases were distributed among 23 families as follows: One family contained 3 cases; three families contained 2 cases each; nineteen families contained 1 case each.

The 24 cases comprising the main group previously mentioned were distributed among 21 families, only three of which contained more than one case and none of these were so-called secondary cases. This lack of secondary cases was due, no doubt, in large measure to the care in handling the patients and the systematic inoculation of other members of the family.

Including maids and hired men, who, for the purpose in view, may be considered an integral part of the families in which they were employed, the total membership of the twenty-three families affected was 127, of whom 60 and 67 were adults and children, respectively. (This division into adults and children may not be strictly accurate, since the ages of other than the cases were not definitely determined, but the figures are substantially correct.) About 22 per cent. of the family membership had the disease. This figure, of course, must not be taken as the ratio of those taken sick to those exposed since, unquestionably, families were exposed to the disease in which no cases occurred.

Table 1 following shows the distribution of all cases according to age and sex. Table 2 is similar, but includes only the twenty-four cases in the main group.

TABLE 1.

Age, Year—	Sex— Male.	Female.	Total.
0- 4	2	..	2
10-19	5	4	9
5- 9	4	5	9
20-49	2	3	5
50-	3	..	3
Total	16	12	28

TABLE 2.

Age, Years—	Sex— Male.	Female.	Total.
0- 4	1	..	1
5- 9	4	5	9
10-19	3	4	7
20-49	1	3	4
50-	3	..	3
Total	12	12	24

The tables show that the disease was confined in large part to children. Of the twenty-four cases in Table 2, 17 or 71 per cent. were under 20 years of age and 10 or 41 per cent. were even under 10 years of age. With the addition of the four cases in Table 1, the percentages were practically the same, namely, 71 per cent. and 39 per cent. for the cases under 20 and 10 years of age,

respectively. The outbreak proper was evenly divided among the males and females.

It may be deduced from a study of the distribution of cases as regards families, ages and sex that a considerable number of families must have been exposed and that the agent of infection was more active among children than among adults. The source of infection was general and not confined to one sex.

In Table 3 the cases have been grouped as regards occupation under four headings. Two classifications have been made, one comprising all the cases and the other only the twenty-four cases in the main group or outbreak proper.

TABLE 3.

Occupation—	Total No. of Cases.	No. of Cases, Outbreak Proper.
Attended school	16	15
Employed in Park Ridge	4	3
Employed out of town	3	2
Stayed at home	5	4
Total	28	24

Distribution of Cases According to Occupation. As might be expected from the age distribution of the cases, the majority attended school. There are three schools in Park Ridge, two public grammar schools and a German school. There is no high school in the city and there were no cases among the pupils attending the high school at Des Plaines. The two grammar school buildings are located near the center of the city. One may be called the main school and the other is known as the north branch school. The latter contains only one or two grades and the rest of the building is used for domestic science and manual training classes from the main school.

The distribution of the cases attending school as regards buildings and grades is given in Table 4 following:

TABLE 4.

School and Grade—	No. of Cases.
Main, grade 1	2
Main, grade 2	1
Main, grade 3	3
Main, grade 5	1
Main, grade 6	3
Main, grade 7	1
Main, grade 8	1
Main, all grades	11
North Branch, grade 4	
Kindergarten	1
German school	1

The cases were not confined to any one room in the schools. The greater number of cases at the main school is to be expected, owing to the greater number of children attending there, but other than that it was not significant.

Of the cases that were employed in Park Ridge and outside of town no two worked at the same place. Of the five cases that, for the most part, stayed at home three were too small to attend school and the greater two were engaged in household duties.

It is evident that the question of occupation had no bearing upon the cause of the outbreak. The fact that a majority of the cases were school children is significant only from the standpoint of age distribution and not from that of occupation. The source of infection could not have been at school, for the schools were closed for vacation during the time the infection must have taken place.

Relation of Social Gatherings to Outbreak. As far as the geographical and chronological distribution of cases is concerned, the infection may have taken place at some party or social gathering attended by the cases during the latter part of December or early part of January. The age and sex distribution of cases would restrict this gathering to one primarily of children of both sexes.

Inquiry, however, as regards attendance at social gatherings or parties during the period in question showed that there had been no gathering common to more than three cases and that about nineteen cases had attended no parties or gatherings whatsoever. It is certain, therefore, that no social gathering entered into the cause of the outbreak.

RELATION OF WATER SUPPLY TO OUTBREAK.

The cases were distributed about the city as would be true in a waterborne outbreak, but in this instance were far too few to even cast suspicion upon the public water supply which is so universally used. Moreover, in a waterborne outbreak adults and children would be equally exposed, which certainly was not the case in this outbreak.

Occasionally, at dead ends the water had a stale taste and this led persons uninformed on the subject to think the water impure. This phenomenon is common in all cities having a public supply and where dead ends exist and bears no relation whatever to the purity of the water.

RELATION OF MILK SUPPLY TO OUTBREAK.

That milk was the agent of infection is very strongly indicated by all the epidemiological evidence so far presented, including the chronological and geographical distribution of the cases,

the number of families affected and the distribution of the cases as regards age and sex. A detail study of the milk supply is, therefore, warranted, after which conclusions may be drawn.

Sources of Milk Supply. There were five dairies that supplied milk to Park Ridge. Two of these had their own farms and produced their own milk, while the other three bought from different farmers all milk sold. The dairies are designated by letters as Dairy A, Dairy B, etc. The farms have been designated by the same letters as those of the dairies which they supplied with milk, and in addition, numbers have been used to differentiate between farms supplying the same dairies. For instance, Dairy A was supplied by milk from farms A-1, A-2, A-3, etc. A general sanitary inspection was made of all dairies and milk farms and the results of these inspections are incorporated as a supplementary report.

TABLE 5.—DISTRIBUTION OF CASES AS REGARDS MILK SUPPLY.

Diary —	No. of Customers.	No. of Cases on Route.
A	204	3
B	160	22
C	167	2
D	36	..
E	30	1
Total	597	*25

It may be seen from Table 5 that Dairy B, which supplied only 27 per cent. of all the customers had on its route 79 per cent. of all the cases. There were only six cases (Cases 11, 12, 20, 21, 27 and 28) not on the milk route of Dairy B. If these six cases can be accounted for, the evidence contained in Table 5, together with all the rest of the epidemiological evidence, is complete and conclusive that the milk supply of Dairy B was infected.

Cases 11 and 12 were two of the cases not on the route of Dairy B, but records were given by these cases showing that on occasions they had used milk from that dairy. Case 11 had visited at the home of Cases 3 and 6 on December 26 and there drank milk from Dairy B. This patient was taken sick on January 19, which would mean a long prodromal period, namely, about three weeks. Considering the nature of the onset of the disease in some of the other cases in the outbreak, a long prodromal period seems entirely possible. Case 12, on Janary 8, drank milk from Dairy B that his aunt who lives nearby had sent over to his home. On January 20, or after a prodromal period of about twelve days, Case 12 was taken sick.

Group of Four Cases. Four cases, namely, Cases 20, 21, 27 and 28 had never used milk from Dairy B. These are the four cases that have been considered separate from the main outbreak of 24 cases. A study of their records shows the manner of their infection or relation to the main outbreak.

Cases 20, 21 and 27 were in the same family and lived outside the city limits. They had used only canned condensed milk or a little fresh milk from a neighbor's cow. Cases 20 and 21 were boys 14 and 17 years of age and were taken sick at about the same time, namely, January 29 and February 2, respectively. About two weeks before these dates the two boys had been skating on the Des Plaines river and, becoming thirsty, had broken a hole in the ice and drank the river water. This water is, at all times, polluted, as it receives the untreated sewerage from Des Plaines and Park Ridge, and at the time the boys drank the water there was especial danger, since the discharges of several typhoid cases in Park Ridge were then being carried off by the sewers. There seems to be no question but what Cases 20 and 21 were infected by thus drinking the badly polluted river water.

Case 27 was a little boy about 2 years old and had not been from home. He was not taken sick until nearly three weeks after his brothers (Cases 20 and 21) were taken sick, and was apparently a secondary case. The chances for secondary infection were exceptionally good in this household, as the mother took care of the cases and attended to her regular household duties and no disinfectants were used. The little boy had been given two inoculations before he was taken sick and he had a mild case.

Case 28, the last case to occur, was employed as a lineman and his work took him about the country. There were two other men in his party and one of these, who did not live in Park Ridge, was taken sick at about the same time as Case 28. As far as could be learned, both men had been affected the same way, although the sickness of the out-of-town man was pronounced grippe and that of Case 28 as typhoid, proven by blood test.

*This total is the actual number of cases considered and not the total of the column. Three cases on the route of Dairy B were also on the routes of Dairies A, C and E, respectively. Two of these three cases, however, in reality generally used only the milk from Dairy B, as the milk from the other dairies was reserved for other purposes.

All things considered, it would seem fair to assume that the cause of their sickness was a common one, and since one of them did not reside in Park Ridge, they may be eliminated as having any connection with the Park Ridge typhoid outbreak.

Milk the Cause of Outbreak. Summing up all the cases then shows that they divide themselves into two groups, a large group of twenty-four cases and a smaller group of four cases. Of the small group of four cases, three cases are shown to have been infected either directly or indirectly by drinking river water and the other case infected elsewhere than in Park Ridge. Of the large group twenty-two cases regularly used milk from Dairy B and the other two cases had used it at such times before their sickness as to admit of its being the cause of their infection. The evidence is not only conclusive that the milk supply was the cause of this outbreak, but there is absolutely no evidence that would explain the infection of any one of the main group of twenty-four cases in any other way.

Source of Infection of the Milk. Before discussing the manner in which the milk supply of Dairy B became infected, a history of this dairy with relation to the outbreak will be given.

On January 22 Dairy B was ordered to stop selling milk by the state and local health authorities. On February 6 Dairy B was allowed to resume business. On February 17 Dairyman B called a physician who immediately diagnosed his sickness as typhoid and ordered that no milk be sold from his dairy. Permission was given to continue the business, however, from Dairyman B's sister's residence in Park Ridge, provided no equipment be removed from the home of Dairyman B and used. This restriction was not complied with and a complete embargo was placed on Dairy B on February 20.

No infection took place from allowing Dairy B to resume business after the first embargo. The late cases in the outbreak evidently had a long prodromal period.

At one time during the outbreak, it was thought the infection of Dairy B's supply had taken place from possibly infected bottles removed from a certain household. A careful inquiry regarding this showed that the bottles were not exposed to infection and the infection could not possibly have come from that household.

Investigation failed to show any source of infection for the milk supply at Dairy B. No persons handling the milk gave a record of ever having had typhoid. Dairyman B was perfectly well until sometime after the outbreak had started and apparently was a victim of the infected milk the same as his customers.

The milk house in use at that time was not a very satisfactory building and there were no provisions for pasteurizing the milk or sterilizing the bottles and other milk utensils. The bottles were simply washed with warm water and soap. The water supply was obtained from two shallow wells and a cistern. The cistern and one of the wells had good concrete covers and the other well had an old board cover. Shallow wells are not a desirable source of water supply, but in this instance there was nothing that would indicate that the water supply had become contaminated with typhoid bacilli.

The milk distributed by Dairy B came from four farms. Farms B-1, B-2, B-3 and B-4, supplied on an average about 4 cans, 2 cans, 4 cans and 1 can of milk daily, respectively. The milk from B-2 was generally separated for cream. The milk from the other farms was, as a rule, handled and bottled separately and certain customers received milk regularly from the same farm.

A list of all the customers of Dairy B was obtained and read off to Dairyman B who stated which milk he used to leave at the different houses. This showed that about 78 customers regularly received milk from Farm B-1, and about 70 customers received milk from Farm B-3. The remaining customers received milk from Farm B-4 or whatever milk Dairyman B had a surplus of. Then as a check, the names of the families having cases were read off and the answers compared with the answers previously given. They all checked exactly.

With the exception of Case 19, all of the cases on Dairy B's route had regularly received milk from Farm B-1. Case 19 was regularly supplied at his home by Dairy B with milk from Farm B-3. Inquiry showed, however, that additional milk was obtained occasionally from a store that handled milk from Farm B-1 as supplied to it by Dairy B. The milk that the two cases not on Dairy B's route had on occasions used, and which was the cause of their infection also came from Farm B-1.

The above shows that only that milk from Farm B-1 was infected. The infection evidently

took place before it reached Dairy B, for if the infection had taken place at the dairy, the milk from the other farms would have likewise been infected. That a cross-infection from the milk from Farm B-1 to the milk from the other farms did not take place may be considered very fortunate, for in such an event the number of cases would have been greatly increased.

An effort had been made to clean the cow barn before the visit was made, but there was still plenty of room for improvement. The owner and his hired man did all the milking. The hired man had been employed for over a year and gave no record of ever having had typhoid. Farmer B-1 had had typhoid fever when he was a boy, but if he had remained a carrier he would have no doubt infected the milk long before. The milk vessels were washed at the house by the farmer's wife. She gave no record of ever having had typhoid. The water for washing the cans was obtained from a cistern and there is no reason to suspect that this water was infected.

The milk very probably was infected from the Des Plaines river water. Farmer B-1 denied ever having used the milk cans to carry river water to the cows, but the hired man at Dairy B stated absolutely that this was done. That it may have been done seems very probable when the water conditions on the farm are considered.

The Des Plaines river had been depended on as a source of water for the cows. When winter came, Farmer B-1 constructed a channel along the bank for the purpose of giving the water such a velocity at that point that it would not freeze. Even if it had been possible to keep a place open, there must have been days when, owing to the weather, the cows could not go to the river to drink, and at such times had to be watered at the barns.

Since fall, however, the three wells on the farm had been dry and Farmer B-1 had been carrying water in milk cans from Dairy B and from a well at an old mill about a quarter of a mile from the farm. To haul all the water that distance for twenty-four cows would be a considerable task, and the temptation to use the Des Plaines river water would be great, especially during the cold weather. The sewers of the City of Des Plaines discharge into the river only about a mile above the farm.

As noted above, contradictory statements were made regarding the use of the milk cans and the river water and further questioning brought no results. All that can be said, therefore, is that there was no safe water supply on the farm, that the temptation to use the river water was great during the cold weather, and if the river water was carried in the milk cans, it may readily have served as the source of infection.

SUMMARY.

The typhoid fever outbreak at Park Ridge comprised 28 cases. These 28 cases divide themselves as regards source of infection into two groups, a large group comprising 24 cases and a small group comprising the other 4 cases.

The large group of 24 cases resulted from the infected milk supply of Dairy B. The epidemiological evidence not only proves this to be true, but eliminates the possibility of any other source of infection. The geographical and chronological distribution of the cases are more or less characteristic of milk-borne outbreaks. The cases were evenly distributed as to sex, which is very characteristic of milk infections since both sexes are, as a rule, equally exposed. A majority of the cases were children, which is another very characteristic feature of milk-borne outbreaks since children are greater milk users than adults. Twenty-two of the cases regularly used milk from Dairy B and the other two cases had used it shortly before they were taken sick.

Dairy B obtained milk from four farms. The different supplies were bottled separately and certain customers daily received the milk from the same farm; with one exception only, those families receiving milk daily from Farm B-1 had cases and the family which is the exception occasionally received milk from that farm. This shows that only that portion of Dairy B's milk obtained from Farm B-1 was infected.

The milk was not infected at Dairy B or all this dairy's milk would presumably have been infected. The source of infection on Farm B-1 could not be definitely ascertained, but may probably have been milk cans contaminated by Des Plaines river water. Contradictory statements were made about the use of the cans for carrying river water. If they were so used they may well have been the source of infection, for the sewers of the City of Des Plaines discharge only about a mile above the farm.

The small group of four cases show no connection with the milk-borne outbreak. Two of these

cases drank water from the Des Plaines river while out skating about two weeks before they were taken sick. This would account for their infection. Another case is a baby brother of these two cases and evidently was due to contact. The remaining fourth case was, in all probability, infected out of town, together with an out-of-town man with whom he worked.

The above article is an abstract taken from Sanitary Engineer H. F. Ferguson's report of the "Outbreak of Typhoid Fever and General Sanitary Conditions at Park Ridge."

A BRIEF REVIEW OF PAVLOV'S WORK.*

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That animal experimentation has done more than enable the surgeon to better wield his scalpel and ply his needle, contributions such as we briefly review tonight amply testify.

Believing the work of secretion in the alimentary canal, so far as it concerned the most important organs of digestion, viz., the stomach and pancreas, not to be as represented in text-books, and consequently existing in the mind of the physician, and desiring to replace the older teaching by a fuller and more correct representation, Pavlov and his co-workers, in their laboratory at St. Petersburg, nearly 30 years ago, began an experimental investigation of the work of the digestive glands. Modern surgical technic—just developing—was a prime requisite. This genius was among the first to insist on what he termed surgical physiology—the work of the laboratory to equal that of the best hospital operating room. Post-operative care of the animals, providing for their comfort in every detail, was a special feature.

In 1897, after ten years' work, the results were published in the Russian language; later in French and German; an English edition appeared in 1902, revised in 1910.

Pavlov compared the digestive canal, from the chief function which it has to perform in the living organism, to a chemical factory, where the raw materials—the food-stuffs—are submitted to an essentially chemical process. In this factory the foods are brought into a condition in which they are capable of being absorbed into the body fluids and made use of for the maintenance of the processes of life. The factory consists of a series of compartments, in each of which the food, according to its properties, is there retained for a time or at once sent on to the next; and each single compartment is provided with suitable reagents. These reagents are either prepared in adjoining little workshops, burrowed into the wall of the laboratory itself, or else in distant and separate organs, connected, as in other large chemical factories, with the main workshop by a system of transmitting tubes. These latter are the so-called secreting glands with their excretory ducts. Each of the workshops furnishes a special fluid, its own particular product, endowed with definite chemical properties which enable it to act on certain portions of the food, this latter being ordinarily formed of a complex mixture of different ingredients. These properties are chiefly contributed by special substances in the reagents, the so-called ferments. The separate fluids, the digestive juices, as they are usually termed, attack in some cases only a single ingredient of the food, in others several. These latter combine the properties of several distinct reagents, each of which acts in its own special way. But even a juice which has only one ferment is a very complex fluid, since, in addition to the enzyme, it holds other substances in solution, viz., acids, alkalies, albumin, etc.

Physiology learned all this by obtaining either the fluids in question, or the pure ferments from the organism, and studying, in the test-tube, their effects upon the constituents of the food, both singly as well as jointly when all are present together. Indeed, it was upon knowledge so acquired that the teaching of the science with regard to the elaboration of the food, or as we say, of its digestion, was based.

Pavlov contended that this conception of the digestive process—essentialy deductive—suffered from many and serious defects. Several questions were undecided; others had not even been raised. For example, why are the fluids poured out on the raw material in one particular order and not in any other? Why are the properties of certain reagents often repeated, combined with different reagents, in other juices? Are all the constituents of a particular fluid simultaneously poured out on the food, and does this happen indiscriminately with every kind of food that gains entry to the digestive canal? Are the reagents

*Read before Englewood Branch, Chicago Medical Society, Nov. 7, 1916.

subject to variations, and if so when, how, and why do such alterations appear? Do these variations simply concern the composition of the fluid as a whole, or are the separate constituents altered in different directions according to the requirements of the raw material? How do the reagents vary with augmented or diminished activity of the whole factory? Is there not a species of contest between the different constituents of the food, in that one ingredient may require a special reagent the activity of which may interfere with that of other reagents or the remaining ingredients?

Pavlov's problem consisted in the working out of a suitable method: 1, to know how the reagents were poured out upon the food brought into the digestive factory; 2, to be able to obtain the reagents at all times; 3, they must be collected in absolutely pure condition, if we were to determine how their compositions varied; also in accurately measureable quantities. Lastly, it was necessary that the digestive canal should perform its functions normally, and that the animal under experiment should be in perfect health.

To better understand the experiments presented, it is well to give here the general plan of innervation of an organ. A complete nervous mechanism consists of the peripheral endings of the centripetal (afferent) nerves, the centripetal nerves themselves, the nerve cells (a group of nerve cells connected with each other is termed a nerve-center), the centrifugal (efferent) nerves, and, lastly, their peripheral terminations. Physiology now accepts it as an established fact, that nerve fibers serve only as conductors of impulses, which come in from contiguous links of the nervous chain. Only the peripheral endings of nerves and the nerve cells themselves have the power of transforming the external stimulus into a nervous impulse. In other words, in the intact organism, these alone constitute the normal receivers of the nervous system. Whether the peripheral ends of centrifugal (efferent) nerves are likewise able to serve as receivers of external stimuli has still to be answered. Consequently, when any external agency excites the peripheral terminations of afferent nerves—the receiving stations—in one or other organs, the effect of the stimulus will be conveyed through the centripetal nerves, as through receiving wires, to the central station—the nerve cells. Here it becomes changed into a specific impulse and then comes back along the centrifugal nerves—the outgoing wires.

The saliva since early days was studied by inserting a cannula in the duct of the gland undergoing investigation.

Pavlov's method: The orifice of Wharton's duct with a portion of mucosa attached is transplanted to the cutaneous surface. By means of a special cement, the wide end of a small glass conical funnel is attached to the skin surrounding the orifice. To its narrow end a small test-tube, which serves to collect the saliva, is suspended by wire loops.

To an animal thus prepared, offer or give a piece of flesh, throw fine sand into its open mouth, or apply to the buccal mucosa the plume of a feather dipped in acid solution, and obtain a strong flow of saliva.

Another animal, with Stenson's duct similarly prepared: Offer the dog a piece of flesh; although eager for the savory food, no saliva flows. Give it some raw flesh to eat; again the saliva is absent. To prove everything connected with the experiment satisfactory, now give the dog finely powdered dry flesh, and obtain at once an abundant secretion.

Briefly, these experiments show the specific excitability of the salivary glands.

Sham Feeding: The earlier methods of collecting and investigating the gastric juice by means of a simple gastric fistula having proved inadequate, Pavlov devised the following experiment: A gastric fistula is made; a few days later the cervical esophagus is sectioned and the divided ends—separated by a bridge of tissue—sutured to the skin. When fully recovered from the effect of this operation, the dog is placed in a frame for observation. Being fed meat, the animal eats greedily, but the whole of the food swallowed comes out again at the esophageal opening in the neck. After feeding in this way for five minutes, perfectly pure gastric juice makes its appearance at the fistula, the stream steadily increasing. The secretion may continue for 3 to 6 hours, with an average of 3 c. c. per minute. This discovery has a commercial value. Considerable quantities of the sterilized product are exported to foreign countries to be employed as a therapeutic remedy as well as a reagent for laboratory purposes.

This experiment demonstrates: 1, the appetite gastric juice—on which Pavlov lays so much

stress; 2, that the effect of the feeding is transmitted by nervous channels to the gastric glands. To confirm the latter statement: At the time of making the gastric fistula, divide the right vagus nerve below its recurrent laryngeal and cardiac branches. Thus only the pulmonary and abdominal branches on this side are thrown out of action; the laryngeal and cardiac branches remain intact. Later (with brief narcosis) the left vagus in the neck is exposed, and a loop of thread passed round the nerve. Within a few hours the animal is ready for observation. The left cervical vagus is now divided. The pulmonary and abdominal branches on both sides are thus paralyzed, while on the right side the laryngeal and cardiac fibers are intact. The animal shows no sign of discomfort. Eats greedily, but not a drop of juice flows from the stomach.

Prof. Carlson, University of Chicago, in his splendid work published recently—containing much of interest to the practitioner—states that dogs with both vagi sectioned exhibit practically normal gastric digestion within a few days after the operation, despite the fact that the appetite gastric juice is eliminated; also, that sham feeding does not satisfy the appetite, even though the sensation inhibits hunger.

Does mechanical stimulation of the walls of the stomach excite the secretory work of the glands?

A gastro and esophagotomized dog is used for this experiment. The stomach is washed clean with water. Folds of red and blue litmus paper are at hand. A feather and a stout glass rod are moved, alternately, in all possible directions, within the stomach, changing from one to the other every five minutes. Not a drop of juice escapes from the fistular orifice. An objection—that we are dealing with a dog out of health, whose gastric glands from some possible cause are unable to react normally—may be set aside by giving the same animal a fictitious meal. After five minutes from the beginning of the feeding drops of juice flow from the stomach. 150 c. c. have thus been collected in 30 minutes.

This experiment disproves the commonly accepted theory of mechanical stimulation.

Of course the motor function of the stomach is not here considered.

Dogs with divided esophagus and gastric fistula are fed by bringing the food directly into the stomach.

The problem of obtaining pure gastric juice was settled by the sham feeding experiment, but this did not afford the means of observing the rate of secretion of the juice and of studying its properties during digestion. Obviously to accomplish this there must be the continuance of normal gastric digestion side by side with a quantitative collection of perfectly pure gastric juice.

A happy idea for overcoming difficulties of this kind was hit upon by Thiry. In order to procure succus entericus—a secretion likewise formed by microscopic glands embedded in the intestinal wall—and to study it in the act of formation, he isolated a cylindrical piece of gut, formed this into a cul-de-sac, the open end of which he sewed into the abdominal wound.

To accomplish a similar result with the stomach, Heidenhain isolated a portion of the cardiac end by a transverse incision, cutting through the branches of the vagus which course lengthwise along the wall of the cavity. To overcome this disadvantage—impairment of the nervous connection—Pavlov contrived an improved method of making

THE MINIATURE STOMACH.

After considerable experience I have found the following procedure (a slight modification of the original technic) satisfactory:

Upper abdomen opened through linea alba; stomach delivered; clamps applied to long axis of viscus; stomach incised from right to left—to zone of posterior vagus nerve plexus; mucosa of isthmus divided and dissected 2 cms. on either side; flaps sutured (in sub-mucosa) so as to form dome-like partition; suturing continued to close both cavities; sero-serous apposition by another line of stitching (illustrated on blackboard); pouch brought through stab-wound; closure of median wound; tube inserted in pouch; dressing.

To describe the matter in a few words, we separated an elongated piece from the stomach, formed it into a pouch; from the distal open end we are to collect juice; the proximal end (nerve supply preserved) remains connected with the stomach.

One week later the juice is collected from the miniature stomach, as follows: A small rubber tube, perforated at its deeper end and provided with a flange of thick rubber at its outer end, is led into the pouch. A short piece of glass tubing is inserted into the outer end of the rubber tube

and dips a little way into a bottle, which fits in a metal bucket with a wide flange having two holes through which are passed tapes; these are tied round the body. During the collection of juice the animal is supported in the standing posture in a suitable frame.

The following experiment shows that feeding with milk, bread, or meat call forth each time special modifications in the activity of the gastric glands.

At 8 o'clock in the morning a dog was given 200 grms. of bread to eat.

Time.	Hourly Quantity of Juice in c.c.	Digestive Power in mm.
8-9 a. m.	3.2	8.0
10 a. m.	4.5	7.0
11 a. m.	1.8	7.0
The dog was now given 200 grms. raw meat.		
12 noon	8.0	5.87
1 p. m.	8.8	3.50
2 p. m.	8.6	3.75
The dog now received 200 c.c. milk.		
3 p. m.	9.2	3.75
4 p. m.	8.4	3.30
An additional quantity of 400 c.c. milk was now given.		
5 p. m.	7.4	2.25
6 p. m.	4.2	2.2

The influence of the different foods upon the digestive power of the juice is striking. The total acidity also varied.

The proteolytic power of the fluid is determined by the process of Mett, as follows: Fluid egg-white is sucked up into a fine glass tube, and coagulated therein at a definite temperature of 95° C. The tube is then cut into small pieces, which are placed in 1 or 2 c. c. of the fluid to be investigated. The whole is kept in the thermostat at 38° C., and requires no further watching. Solution of the proteid occurs at the ends of the small glass tubes. After a certain period, the length of the pieces of tube, and of the undigested remains of the proteid column are measured off with the aid of a millimeter scale and a microscope of low magnifying power. The difference gives the length of the digested proteid cylinders in millimetres and fractions of a millimetre.

To demonstrate its value in experimental pathology of digestion, Pavlov introduced for a few minutes into the small stomach a 10 per cent solution of silver nitrate. The profuse secretion of mucus, which followed, naturally led one to suppose that a morbid condition had been established, but its complete disappearance within 24 hours forced the conviction that the pathogenic influence had been successfully encountered and conquered before one's eyes. The surface epithelium had poured out a sufficient quantity of mucous fluid to dilute the noxious substance, and expel it, thus protecting the more important elements beneath.

By direct application of a 10 per cent. solution of silver nitrate a condition of asthenia—weakness and irritability of the peptic glands—was produced, diminishing the secretion considerably.

In a recent research on gastric and duodenal ulcer, by injecting a small quantity of 5 per cent. solution of silver nitrate into the wall, we caused a typical lesion in the small stomach.

To correct the current belief regarding the action of alkalies in hypersecretion, Pavlov treated a series of dogs in which this trouble arose from illness or was produced intentionally, by the administration of a solution of sodium bicarbonate. This treatment diminished markedly the hypersecretion and set aside the exalted excitability of the glands. In other words, the healing effect was due to inhibition. For the first time known, Mr. Watts and I recently made a Pavlov accessory stomach in the opossum, and are now using six such animals in a research.

THE PANCREAS.

The formation of a permanent pancreatic fistula had always constituted one of the most difficult tasks in experimental physiology. Tying a glass tube into the duct and leading it through the abdominal wall, or fastening a T-shaped piece of twisted lead wire in similar manner, were tried and found wanting.

Pavlov devised a means of access to the gland lumen by which the duct could be kept open for any desired length of time. Briefly: From the wall of the duodenum, a piece containing the orifice of the pancreatic duct is cut out, the bowel then stitched up, its lumen not being appreciably narrowed, and the isolated piece of intestine (with the mucosa outwards) sewn into the slit in the abdominal wall.

Two weeks later the animal is ready for observation.

Protection of the skin from the eroding effects of escaping juice was a problem. Frequent washing of the surface with water and smearing with emollient ointments helped, but the best method was learned from one of the animals operated upon. A dog having a pancreatic fistula tore a heap of mortar from the wall of the room for two

consecutive nights. The appearance of cutaneous irritation was considerably reduced. The juice had been absorbed by the porous material. Following this discovery, a bed of fine sand was provided, on which the animal lies, except during the hours of the experiment.

Bread and milk, with the addition of sodium bicarbonate, is the usual diet.

To estimate the activity of the proteolytic and amylolytic ferments: Thin glass tubes are filled with colored starch paste and then exposed in the thermostat to the influence of the ferment for half an hour. The paste is dissolved from the ends inwards; the extent of the action, owing to the coloration, being clearly visible. The length of the digested column is measured and expressed in millimetres.

Pavlov, by experiment, showed that:

The work of the pancreas, like that of the gastric glands, is also specialized in regard to the hourly rate with which the secretion is poured out on the different classes of food. For example, if a dog be fed for some time on bread and milk, and then be given an exclusively flesh diet, containing more proteid but scarcely any carbohydrate, a continuous increase in the proteid ferment of the juice is observed. The ability to digest proteid waxes from day to day, while, on the contrary, the amylolytic power of the juice continuously wanes.

The vagus is the secretory nerve.

The acid chyme acting on the mucosa of the duodenum and jejunum is an exciter of the pancreatic secretion.

Alkalies have an inhibitory effect.

Fat is an independent exciter of the pancreatic gland.

Sham feeding may excite a moderate flow of pancreatic juice.

Water is an independent and direct exciter of the secretory mechanism of the pancreas.

To acquire definite knowledge of the bile, Pavlov believed it essential to ascertain the quality and quantity of this fluid poured into the alimentary canal. Such was not possible with the common duct or gall-bladder fistula. He therefore transplanted the natural orifice of the bile duct to the cutaneous surface. The technic is similar to the making of a permanent pancreatic fistula.

He was convinced that the chief digestive use of the bile was to promote pancreatic digestion, both directly and indirectly. It arrested the action of the pepsin, which was injurious to the ferments of the pancreatic juice, and favored the ferments of the latter; in particular the fat-splitting ferment.

He concluded from experiment that the succus entericus possessed, to a striking degree, the power of augmenting the activity of the pancreatic ferments, and more especially the proteolytic.

The importance of appetite is discussed at length, and the physician advised, in treating digestive disorders, to constantly bear in mind the psychic element connected with the desire for food. For example, a brain-worked individual, who cannot for a moment distract his thoughts from his daily work. He eats without observing it, or eats and carries on his work at the same time. This often happens, particularly in the case of people who live in the hurry of great cities. Such systematic disregard of the act of eating prepares the way for digestive disturbances in the near future, with all their consequences. There is no appetite juice, no "igniting juice," or, at best, very little. The secretory activity comes slowly into play; the food remains much longer in the digestive canal than is necessary, or passes, for want of sufficient digestive juices, into a state of decomposition which irritates the mucosa of the alimentary canal, and brings it into a condition of disease. No medicinal treatment can help such a patient while he remains in the midst of his old conditions. The fundamental cause of his illness still continues. There is only one course to pursue, namely, to take him completely away, to free him from his occupation, to interrupt the interminable train of thought, and to substitute for a time, as his only object in life, the care of his health and a regard for what he eats.

The rationale of the menu is cleverly explained. Beginning with soup or meat broth, we make use of a known chemical excitant of gastric secretion; after this come the really nourishing foods—flesh meats of different kinds served in various ways; or, in the case of poorer people, stews made with vegetables, and, therefore, rich in carbohydrate material. The chief meal generally ends with something sweet, and everybody knows that sweets are pleasant. The repast, begun with pleasure, consequent on the pressing need for food, must also, notwithstanding the stilling of hunger, be terminated with an agreeable sensa-

tion. At the same time, the digestive canal must not be burdened with work at this stage; it is only the gustatory nerves that have to be agreeably excited. This sequence of foods, from the standpoint of physiology, is quite rational.

The many researches based on his work, the frequency with which his name appears in medical literature, indicate the fulfilment of Pavlov's wish that his work may serve as a stimulus to others.

He believed the final triumph of medicine can only be achieved by laboratory experiment. The progress of medicine will go hand in hand with the care and attention paid to its experimental departments.

In recognition of the value of his contributions to scientific medicine, Pavlov in 1904 was given the Nobel prize.

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DIABETES MELLITUS—WHY DO GLYCOSURIA AND ACIDOSIS INCREASE DURING WORK IN SOME DIABETICS?—A SUGGESTION IN TREATMENT.

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Hitherto, the glycosuria produced during work in diabetics (particularly of the juvenile type) has been attributed to increased nervous discharges, in spite of the fact that the added utilization of heat calories should cause a decreased glycosuria, due to increased combustion of sugar. The above factor has frequently interfered with completeness and permanence of cure and might precipitate marked glycosuria, acidosis, loss of weight, coma and death.

The writer believes that the cause is partly to be found in mobilization of tissue fat during work. That the normal body can mobilize and use tissue fat during muscular activity, is known. Is the diabetic of this type, although able to mobilize fats, unable to utilize them, so that they form fatty acids in the liver (acidosis)?

Pavy and Bywaters,[1] a few years ago, showed by laboratory experiments on animals, that perfusion of the liver with sodium carbonate will arrest the change of glycogen to glucose (in the hepatic cells), as though the liver had been frozen, when the glycogen remains intact (not mere cooling, however, which may assist the transformation). The accumulation of acidity, however, changes the glycogen to glucose and the latter is poured out of the liver. The liver has to be alkaline, or nearly so, to be able to hold glycogen. That is why one sees cases which, after storing up glycogen, ingest excess fat, or overwork themselves, mobilizing extra tissue fat, in addition to that ingested, acquire acidosis, which in turn (the diacetic acid being formed from fat in the liver) causes a sudden high percentage of sugar arising chiefly from that stored in the liver, to be excreted in the urine. Hence arises a vicious circle (*i. e.*, no glycogen in the liver to assist fatty acid combustion), the acidity accumulates (mostly in the liver), there is no longer an appreciable formation of glycogen and the sugar is excreted, with less and less fat and carbohydrate utilized.

This explains what may be called "reservoir diabetes," often seen in the juvenile type. The patient is fasted, the liver thus freed from an excess of fatty acids, and in the early stage of feeding some of the glycogen accumulates, burning some of the fats. Now the patient is fed bacon, cream and other fats, forming acids, and the "reservoir" pours out what glycogen has accumulated. Then the patient is fasted again. I have seen cases receive close to a quart of cream with bacon, olive oil (with salad), butter, etc., daily and have not marveled at the glycosuria and acidosis that inevitably appear.

Closely connected with these facts are the suggestive data[2] concerning the relative fat and glycogen content of the liver.

1. In a young man:
   763 p. m. water.
   25 p. m. fat.
   153 p. m. protein, etc.
   61 p. m. extractives.
2. In a healthy suicide:
   606 p. m. water.
   212.8 p. m. fat.

"The amount of glycogen and fat may vary considerably, which is due to the fact that the liver is a storage organ for these bodies, especially for glycogen." "The quantity of glycogen in the liver depends essentially on the food." "The quantity may amount to 120 to 160 per mille. When the liver is rich in fat, the glycogen values are low." Rosenfeld and Bottazzi (loc. cit., p. 384) have shown that a liver rich

1. J. Phys., 1910, xli, 169.

2. Hammarsten: Physiol. Chem. (trans.), 1914 edition.

in fat is habitually poor in glycogen. In the above example, there is a difference of 187 grams of fat content between two livers. An average liver of 1705 grams may contain after carbohydrate feeding, 204.6 grams of glycogen (approximate). When the liver is full of fat or the seat of fatty acid formation, the blood plasma has to act vicariously as the reservoir for glucose, which it cannot hold and must excrete in the urine.

It is absurd to overfeed our patients with fat, particularly when they are at work and unable to utilize the added mobilized tissue fat, that appears during body activity (if the above premises are true). I believe that a very few grams of extra fat may precipitate an acidosis in certain types of cases.

On the above grounds, therefore, the writer recommends for this type of diabetes, the following:

1. Restrict fats more or less.

2. Keep up the "alkaline reserve" of the body and blood plasma, which has recently been shown to fall very low in some of the cases. The liver should be kept constantly alkaline, or nearly alkaline.

3. Aim to keep the liver storing more glycogen and less fat. Where grams of sugar intake count, grams of glycogen capacity of the liver form an important item. (This may explain some of the success of starch or potato cures.)

4. Remember that the chief value of rest in diabetes may be largely due to restraint of subcutaneous and other tissue fat mobilization.

The physician who would treat diabetics on these lines should realize the following important points:

1. You cannot replace fat by glycogen in the hepatic cells in one day or one week, but you *may* be able to accomplish the same in two or three weeks. When you once have a glycogenized liver, keep it so (*i. e.*, keep it alkaline to avoid acid destruction of glycogen). The glycogen that you have caused to be stored at so much pain and trouble for weeks, may, in one unfortunate day, be completely discharged from the liver lobules, allowing fats and fatty acids to pile up. These principles should be of value, no matter whether the cases are fasted, on pancreatic opotherapy, starch, oatmeal or potato diet, or any other method of treatment.

2. The restriction of fats, the writer has found, allows proteid to be taken care of and makes feasible the use of pancreatin or other pancreas preparations, by bowel and possibly orally, in cases which would not otherwise react well to the organotherapy.

3. Courage is necessary to push the use of alkalies until the urine is no longer acid, but at the same time one should be on guard against acidosis on the one hand and alkaline edema on the other.

In conclusion, although the present day trend is away from alkalies, there are a class of cases with low alkaline reserve, which might do better with long continued alkaline therapy. (Whether sodium bicarbonate, magnesium oxide, etc., are in addition, calcium sparers in the system has not been proven.) Physical labor may precipitate an acidosis and glycosuria which may not be due entirely to nervous factors.

MENTAL MECHANISMS.*

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Man's mental state is the product of his experiences, his ability to associate the concepts of the past with the present constitute his powers and limitations in creative effort.

The artist of the movie world has discovered the key to success in his field of endeavor, that of introducing into his film the feature which arouses the instinctive impulses of his audience. The great serial stories are woven about those characters who by their conduct are reacting to primitive impulses. The means of defense adopted by the characters fascinate the audience, and the tact and cunning employed by the artist in an effort to adjust his character in response to primitive impulses make for the success or failure of the feature.

The most universal law of biology is the tendency of all forms of life to adapt themselves to the environment in which they are placed. All persons are reared in an environment quite similar, resulting in quite uniform modes of adaptation. To the man whose environment requires the exercise of certain attributes in the psychological field there comes to him strength in ratio to the demand. This adaptation is in harmony with a similar law in the physical development of

*Read before the fifth annual meeting of Alienists and Neurologists at Chicago, June 20, 1916.

all animal kind. The psychological adaptation may enable the individual to progress until adult life is reached, when new demands and constantly altering conditions create new impulses for which his mental mechanism may be inadequate and if this type of adaptation cannot give the impulse the necessary outlet, a psychosis results.

This failure to adjust developing rather abruptly in one who has always possessed the power suggests some change in physical structure. It is only natural to search for the anatomic basis of any disorder, and while gross lesions of cellular structure of the degenerative type are readily distinguished, it is quite probable that our limited knowledge of cell life in the cortex will preclude our detection of definite changes in those cases which we elect to designate as functional. With primitive instinct forming the basis for conduct in normal people, we must recognize instinct as capable of lending color to many psychoses of toxic and organic origin, and further capable of directly producing psychoses in other cases where organic changes do not exist. The organism through life does not retain the power to adapt. Channels once open afford the natural outlet for impulse, and the tendency for persistent outlet through definite channels give rise to what we are pleased to term habit. The individual who permits this instinct to control his conduct is paving the way for a psychosis, and serious results await the one whose impulses based upon fear and sex instincts are not properly censored.

Fortunately, man possesses the power to inhibit the reproduction of stored precepts capable of exerting a baneful influence upon the organism or inclined to provoke a course of conduct out of harmony with his environment and the accepted conventionalities of modern civilization. The inhibition of certain impulses and the voluntary control of the threshold of consciousness results in the diverting of simple instinctive conduct into channels of usefulness closely linked with the progress of the individual.

When this process directs one into a mode of behavior entirely conventional and calculated to meet the demands of society and modern business, we are pleased to refer to his reaction by the use of the term intelligent conduct in counter-distinction to unintelligent or insane conduct. What we really mean to convey is that the individual conforms to conventional modes of living, acting and talking.

Instinct has been described as the innate tendencies of the members of a given species to react to definite stimuli with a type of conduct suited to the situation without first having learned the necessity for such conduct by having previously faced situations calling for the reaction.

The mechanisms underlying behavior in the lower forms of life are crude and manifested in very simple forms of conduct. Stimuli call forth appropriate reactions almost as automatically as the pressing of a button extinguishes a light. As we advance in the scale of animal kind the reactions increase in complexity in direct ratio to ever increasing requirements, until in man we find the capacity for modifying instinctive reaction to suit the ever altering condition.

By reason of this power of adjustment we assume that man is able to meet the very complexed requirements of every-day life. The concrete statement will meet with no opposition among those who recognize man's psychic powers, but the acceptance of this calls for the assumption of a definite mental mechanism working to accomplish this result.

In the processes of adjustment let us consider first an instinct found in all forms of animal life and well preserved in man, the instinct of fear. Animals low in the scale are frightened by stimuli emanating from any sense impression and, as their faculties for adjustment are limited, they retain this reaction instinct through life; but in man, while the innate disposition to fear reaction is not far different from that in animal, the mechanism of adjustment has produced in him a modification in the cognitive part of his instinct.

In the constantly widening knowledge of the sources of danger there develops in him an increasing number of sense impressions capable of arousing instincts of fear and the reaction of flight, and as man's increase in forms of conduct or behavior keeps pace with his ever increasing knowledge, the factors of experience, habit and inhibition produce in man an exceedingly complex form of fear reaction.

Much of the abnormal behavior observed among the insane as well as the sane is but the expression of a modified fear reaction. Physical combat for defense is not the only mode of defense with which man may react. Flight is not the only means he may embrace to prevent personal harm. The individual who steals, who

lies and deceives, is in fact reacting to the innate instinct of fear by what he believes an appropriate type of conduct. As a motor difficulty may depend upon an affection involving the afferent, efferent or central part of a reflex arc, so may mental mechanisms be involved in the cognitive effector or conative portion.

With this conception of mental processes we are able to account for some of the mental disorders that may arise from purely mental source. We may regard pleasure and pain as a part of the effective portion of every primitive mechanism of adjustment operating by cutting short those forms of activity which are baneful in character and prolonging those which are pleasurable. The value of this mode of reaction lies in their power to protect the organism against harmful influences and to favor the influences which are beneficial.

That there exists within the body stored energy which may be converted into any mode of activity we may elect is quite obvious. The ability of the organism to endure long strain and stress is apparent on every hand, manifested in illness, in times of physical endurance and intense mental effort. This fact forces us to admit the existence of potential energy in reserve, under normal conditions, capable of sustaining the organism through periods when the process of up-building must be suspended and for the further purpose that continuous effort applied in a given line with a culminative effect may continue uninterrupted. The existence of this store of energy, however, suggests a possible source of harm when converted into psychic force, and admitted to an avenue for outlet through channels undesirable. Such force exerted without the proper inhibition gives rise to thought and conduct recognized as abnormal and out of harmony with environment.

In observing a mental case of alcoholic origin we find fear a prominent symptom. This drug, like many others, acts upon the perceptive mechanism, making it very difficult to distinguish between the imaginary and the real, thus inviting hallucinations of a terrifying character and delusions persecutory in type, through the mechanism of the primitive fear instinct.

The paranoid types manifest fear instinct unrestricted and in their reactions develop delusions which dominate the individual. By reason of the seeming logic of these delusions the individual is seldom recognized until some overt act brings him in contact with the law; it is then discovered that the individual's life has been made up of a series of reactions prompted by the fear instincts and based upon the effort of the individual toward adjustment to an abnormal perceptive mechanism.

We may also regard the criminal as one who owing to constitutional defect, the instinctive forces being illy directed, finds outlet through improper channels, giving rise to anti-social conduct.

The mental manifestations of the involutional melancholia and the senile cases support the theory that the instinct of defense or the fear impulse remain intact so long as life exists.

The influence of the fear impulse upon the internal secretions indicates the profound effect it exerts on the organism. The prostitution of this normal impulse through the abnormal excitation may induce chemic changes that will only be explained when our knowledge of the chemistry of internal secretions is elaborated.

The orderly arrangement of complexes upon a background of feeling-tone constitutes or determines character, personality and individuality. The creation of the proper feeling-tone is the function of education. Freud has defined a censor of consciousness, the function of which is to repress unethical and unconventional experiences. The resistance offered by the censor is sometimes compromised admitting to consciousness the experience either in symbolic form or by conversion. That these repressed complexes are the basis of many a peculiar manifestation through the agency of the sub-conscious is rather generally accepted. That these complexes owe their individuality to the coloring offered by the defense, reproductions, or sustenance instincts, is quite obvious. Thus the influences of the primitive instincts in all types of mental disease make for a complicated symtomatology and a rather confusing train of mental manifestation, each resting upon the foundation of primitive instinct, but ofttimes associated rather loosely or by symbolism.

If psychic trauma directed toward the sex instinct in the early years of life creates so profound an effect in an individual that the repression of the experiences produces symptoms which entirely dominate the patient, rendering him

a subject to neurasthenia, psychasthenia, hysteria or obsession, then why not regard traumas directed toward the defense instincts "expressed in fear" as capable of influencing the psychic processes of the individual throughout life?

The disciplinary methods used by mothers and by teachers in dealing with their children are a series of assaults against the natural reactions. The mythologies of youth are decoys to inveigle the child into proper channels of thought and to stimulate creative and elaborate endeavor.

The fantasies or threats of physical violence and personal harm, however, serve no such useful purposes.

The feeling-tone cultivated by repeatedly arousing the child's sense of fear is an abnormal tone, and productive of morbid processes.

The mental mechanism involved in the building of childish fantasies are the ones employed in day dreaming and castle building, the logical termination of which is a loss of keen discrimination in dealing with truth and fiction.

From the above observations we feel justified in formulating the following deductions by way of conclusion:

First, the child may be so reared that he develops abnormal fear reaction, becomes susceptible to stimuli arousing the instinct and develops a suspicion or distrust harmful to the organism.

Second, that this type of reaction is in evidence in many forms of mental difficulty is a matter of common knowledge.

Third, that it is a legitimate product of unwise methods of discipline in early life and the faulty methods of reacting to a normal instinct created for self-preservation.

Fourth, that as a psychological factor it is worthy of consideration in the home, in the school and in the study of mental disease.

CEREBRO-SPINAL LUES TREATMENT.*

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At the outset, I wish to define the treatment under study, as an attempt to restore the patient entirely or in a degree to his natural condition and surroundings, and not merely to attempt the correction of a plus blood or cerebro-spinal fluid Wassermann, one or both obtaining.

To view the human body as governed by definite biological laws, and not properly considered as a test tube into which all qualities of drugs can be poured, I have advocated and employed the most intensive methods of treatment and have been guilty many times of watching too closely the bio-chemical reactions, without regarding equally important the truly great factor, i. e., the patient's general health.

There is no phase of treatment of the sick demanding such tactful consideration as the inflammatory diseases of the central nervous system, and among the latter nothing produces such profound symptoms as syphilis. We rightly consider lues as a basic factor in our neuro-psychasthenic cases; hard to demonstrate clinically and bio-chemically, but conditions so frequently responsive to mercury as to make all eligible to such treatment. The field seems limitless and demonstrations of syphilis so varied that an attempt to cover it entirely in this paper is both impracticable and impossible.

Much of uncured and incurable syphilis today points to lack of knowledge before the discovery of Schaudinn, the demonstration of Noguchi and Moore and incomplete examination and treatment. The question of family tendency is very important to consider at this time, as it has been observed frequently that families present similar pathology after infection—given lues—several brothers are tabetic, epileptic, or paretic, a neuropathic tendency that is frequently prevalent and which means, to my mind, that such groups, unless most consistently treated, will follow a retrograde change, knowledge most valuable in outlining the patients' treatment and for planning the patients' future.

The entire scheme of treatment is directed toward, *first,* the control of toxemia and its attending inflammation; *second,* toward assisting nature to compensate for what has been lost of nerve tissue and physiological components.

Blood stream pollution can best be controlled by salvarsan, but vascular crises must be kept in mind in its use. Some reports seem to indicate the possibility of central hemorrhage being hastened by its use. To this I will not subscribe, but rather to its abuse, i. e., to the employment of full initial doses. The minimum

*Read before the fifth annual meeting of alienists and neurologists at Chicago, June 20, 1916.

dose for general lues should be maximum for brain and repeated at frequent intervals. The conjoined spinal puncture I consider extremely valuable by this means, allowing certainly a freer osmotic process at the choroid, granting that the cerebro-spinal circulation is intact. In early C. N. S. envolvement, it is usually sufficient to attack the blood stream singly and defer intro-spinal injections; however, an early basilar envolvement warrants the autogenous serum. The mention of technique of various treatments, preparation of serum is unnecessary to this body, but of the character used I must remark that only the autogenous seems practical, valuable and safe. I have frequently given serum from other patients with no untoward results and it seems none should come, but a colleague reports a disastrous result which unfortunately no post-mortem substantiated.

I consider horse serum unnecessary and unsafe. If a patient cannot lose enough blood for serum preparation, he needs more attention paid to his hemopoietic than to his central nervous system.

Mercury, in whatever form is convenient and best borne by patient—it is a personal matter to be settled by each—so long as the patient gets mercury to the point of tolerant safety all is well. Iodides I cannot consider seriously in the treatment of any form of specific central nerve envolvement unless we can allow them a certain liberating effect, making the spirochete more accessible to the aneaic or mercury.

This scheme of medication is accepted by all who work in this field, excepting some whose opinions I respect very highly indeed, who have never used salvarsan in any form and never will, charging that it makes for early hemorrhage and tabes and is a general vascular weakener.

Most important is the absolute control of the patient. The specific nervousness, the vague apprehension, morbidity, constant motor agitation demand institutional treatment or restraint and even with the most constant watchfulness, their destructiveness, run-away tendencies, make them a source of worry in their own homes and a menace to public safety. As we proceed in the scale of tissue involvement, the more attention must be paid to the habits, environment, business, domestic cares, diet, etc.

Any routine of specific treatment is unjustly given which does not provide comfort, quiet and as great a degree of peace of mind as conditions will permit.

He who sets about to repair the paretic brain or tabetic cord, with drugs alone, claims a superhuman power, but many times the border line cases are pulled up and saved from complete annihilation—such case reports are made with mistaken diagnoses which claim a repair of tissue that as nerve tissue is functionless.

In short, we must early determine the classification of tissue involvement and carry on intensive plus general treatment in meningo-vascular cases hopefully; in parenchymatous cases as a matter of duty, hoping that the process may be stayed and enough cortical cells remain unscathed to constitute a semblance of control and intelligence.

The treatment of incipient tabes deserves especial mention because much good has been done by general and direct treatment. The relief of pain and with it, restored nerve balance, seems the most possible and regular result and no symptoms but these have been relieved in my experience by any sort of treatment. Gummata, if in operable site, are to be treated as tumors if a reasonable period of treatment does not suffice; the treatment of cranial and spinal nerve lesions is the treatment of the inflammatory changes, or pressure with arsenic and mercury and by rachientesis.

The irregular pupil of cerebro-spinal lues is a sign probably of vascular changes—its inconstancy, i. e., its variable reaction, indicates the uncertainty in prognosis and one should not forecast from one examination or from one favorable laboratory report.

The fundus is a most valuable index of both condition and progress of central nervous affections and the retina almost correctly spells the condition of vascular system, the cerebral circulation and cord status.

If there is any short route to the control and correction of actual central nerve lues, I do not know it.

There must be a constant checking up of laboratory and clinical findings and avoidance of set rules for dosage and general routine. The variance of age, environment, habits, race, must be weighed with the sum total of what the body generally shows.

If a chronic aortitis, hepatitis, splenitis, osteitis obtains, as it does very often, as much or more treatment toward the relief of these is needed as toward the amelioration of inflamed nerve cells.

We have heralded salvarsan as the sterilisans magna, but is it? We have accepted mercury always as the true specific, but is it? How explain the long remission of untreated paresis so-called, unless there is a natural defense sufficient to produce a remedial agent. It is my belief in natural phenomena of this sort—in actual cure of disease, if you please, which warrants the use of autogenous sera intravenously with mercury or arsenic, or mercury intraspinously and intra-ventricularly.

The completion of treatment is a question which concerns the average patient or the responsible member of the family and is indeed hard to even justify in its answer to the laity, who, taught to view old diseases as having regular courses, accept reluctantly the necessary explanation of laboratory-clinical control and nothing but the morbid fear which attends lues keeps them under treatment. Personally, I have dismissed no person as cured, but keep them under observation and hold out as the only hope that if there is a repeated negative Wassermann of blood and cerebro-spinal fluid occasionally provoked by 606 over a period of two or three years, that as near a perfect result as possible had been obtained; no luetic brain or cord, however slightly evolved, or how completely cured, can be counted as normal, but if the lesions can be rendered sterile and inactive, the remaining tissue can compensate to a remarkable degree and after all approximate the normal.

It is not my intention to discuss drugs or their manner of administration, because the profession must certainly be united on this subject, if on nothing else. I have enjoyed speaking with and hearing from a number of our unquestionably best men in the country and with the exception of one who stands alone, in questioning the value of salvarsan, they look upon the treatment as naturally following only one course, namely, by the intra-venous, intra-spinous, intraventricular route of salvarsan and mercury to be given as best result can be obtained.

The real occasion for this report arose from my own experience, cases in which I have been misled by laboratory findings as perfectly negative for a long period of time and then suddenly bursting out clinically and bio-chemically; others have shown all of the clinical findings and responded only to the treatment of their general health.

In all eagerness to work wonders with drugs, we have very often forced common sense into the background. It behooves us to consider seriously the future of every case of cerebro-spinal syphilis, knowing as we do, and feeling as we must, that many of the milder forms clear up very rapidly under treatment and these have been reported as our magic cures, and because of the wonderful transition the patient has been allowed to slip out of our care, and I feel that these are the very cases that reappear after years of apparent health with the neurological display that is both illuminating and tragic.

Noguchi insists that he has found a spirochete of this so-called mild type repeatedly in the brain of paretics, and the case reports have shown an extremely mild early infection.

I plead for a general educational movement which instructs and teaches people that they are indeed sick when they have syphilis of the nervous system and rightly in need of a physician and should peacefully submit to routine of quiet, carefree living and give themselves over unpreservedly to the dictates of nature's best hygienic laws. They have been taught to rest in bed with fevers and infection of every other sort, but have not been taught the value of having unqualified physiological assistance in specific infection.

We must also bear in mind that the population of our public institutions bears a remarkably close relation to our success or failure in the treatment of syphilis of the central nervous system.

A CASE OF JUVENILE GENERAL PARESIS.*

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Juvenile paresis, i. e., general paresis developing during childhood or about the time of puberty, until recent years was considered a rare disease. With increased facilities for diagnosis and a more carefuly study of the idiot and feeble-minded group, today we consider the disease as uncommon.

*Read before the fifth annual meeting of Alienists and Neurologists at Chicago, June 19, 1916.

The first case was described by Clousten in 1877, since which time about two hundred and seventy-five cases have been reported by Alzheimer,[1] Hirschl,[2] Thiry,[3] Mott,[4] Marr,[5] Idrac,[6] Palancar,[7] Kleineberger,[8] Fairbanks,[9] Hough,[10] May,[11] Collet,[12] Riggs,[13] Diller,[14] Jelliffe,[15] Laffer,[16] Leonard,[17] Leroux and Weinzweig,[18] Alsimoles and Alberstadt.[19].

Kraepelin[20] states in his monograph on general paresis (1913) that it is not uncommon for him to be able to demonstrate four cases at one time in his clinic, and we believe that if the more or less common dementing states of children were studied with the aid of the present day laboratory methods, many more cases would be diagnosed.

After a careful search of literature, I have been unable to find any report of a case of juvenile general paresis in which the brain and organ tissues have been examined for the presence of the causal organisms of syphilis. Without attempting to summarize or discuss in detail the literature on this subject, I wish to report a case having a clear history of intrauterine infection, with deterioration beginning during the fourteenth and fifteenth year, with a clinical course of four years, the finding of double nucleated cells of Purkinje in the cerebellum, and spirocheta pallida in the cerebrum, cerebellum, heart, liver, kidney and spleen.

Case —. C. F., white male, aged 17 years. Admitted to Central Indiana Hospital, October 25, 1913.

Family History: Paternal uncle feebleminded (inmate of Madison County, Ind., Poor Farm); two paternal aunts were insane and patients at Richmond, Ind., Hospital. Father, an alcoholic, is living as far as known. Mother, 36 years of age, is living but in poor health. At the age of 17 years, gave birth to our patient. She states that she had a rash over her entire body, accompanied by sore throat and ulcers in her mouth, while she was pregnant with this child. At 18 years of age, she married William N. Six pregnancies resulted in one miscarriage and five living children. Examination of her blood serum gave a positive Wassermann reaction. Mentally, she is somewhat deficient and makes frequent contradictory statements. A half brother, Clyde, aged 15 years, is very much under-sized (appears about nine years old); has a chronic coryza, high, narrow, hard palate and pegged teeth. Is dull mentally and has never advanced beyond the third grade in school. For two years has been stupid at times and so confused that he was lost on the street near home. His blood serum gave a positive Wassermann reaction. Half brother, Clarence, had a skin eruption, with ulcers of the mouth and throat and a coryza at birth. Only lived seven weeks. Cause of death: inanition. Half brother, John, is said to have been healthy. Was accidentally shot by his brother Clyde, when five years of age. Half brother, Roy, aged five years, appears healthy, but has had a chronic coryza since infancy. Has irregular teeth, and a positive Wassermann reaction in the blood serum. Half brother, Albert, aged one year. Palate arch high; no teeth erupted.

Personal History: Born out of wedlock, in Madison County, Indiana, in 1896, at full term. At birth his body was covered with a rash, and later there were extensive ulcers in his mouth. Made no attempt to walk until after he was two years old. Later learned to talk. Never took an interest in childish games. Was raised by a farmer. Attended school from his sixth to thirteenth year, but only passed four grades. During the next two years gradually lost interest in his surroundings and in his work. In October, 1912, began to complain of pain in his head, which was worse on exertion. In March, 1913, became irritable and fretful. Late in September, 1913, after a period of depression, had a severe general convulsion and that night became violent and threatened to kill members of the family. He was confined to prison the next day.

On admission to the hospital, October 25, 1913, he was depressed and retarded; his pupils reacted poorly to light and his knee jerks were exaggerated. On December 18, 1913, he became noisy, restless and confused, and on the 23rd, had a series of general convulsions, which continued with intervals of twenty-four to forty-eight hours until January 16, 1914. Some of these convulsions were followed by transient paralysis of the right arm and leg. During the next six months he improved physically; reacted to auditory and visual hallucinations, and expressed some childish ideas of grandeur.

Mental examination at different times may be summarized as follows: Completely disoriented for time, place and persons; memory for remote and recent events very much impaired; train of thought irrelevant and incoherent; consciousness clouded; attention held with great difficulty; emotionally, is mildly exalted; expresses childish ideas of grandeur; at times reacts to hallucinations; test phrases are repeated with marked slurring and elisions.

Repeated physical examinations may be summarized as follows: Poorly developed, fairly well nourished, puerile, white male; epitrochlear and postcervical glands enlarged; teeth irregular and crowded together; hard palate, high arched and narrow anteriorly; fine tremors of the facial muscles and tongue; right pupil dilated and irregular; light reflex delayed in both pupils; deep tendon reflexes all bilaterally increased; tendency to ankle clonus on right side. Examination of thorax and abdomen, negative.

Blood serum gave strongly positive Wassermann reaction on three different occasions. The spinal fluid on two examinations gave increased globulins, pleocytosis (34 cells), strongly positive Wassermann reaction with .05 c.c. spinal fluid, and a typical paretic curve (5, 5, 5, 5, 5, 5, 4, 2, 1, 0), with the colloidal gold test.

On September 15, 1914, he began to have a series of general convulsions which resulted in death from exhaustion on September 18, 1914.

Autopsy: (For details see clinical records)—thirteen and a half hours after death: The body is that of a fairly well nourished male, apparently about 15 years of age. The pupils are dilated, the right is irregular. The organs in the body cavity need only be described by mentioning their gross pathological diagnosis:

Circulatory System: Pericardial effusion; chronic pericarditis; eccentric hypertrophy and dilatation of heart; chronic fibrous valvulitis of the mitral valve; fatty infiltration of the heart muscle.

Respiratory System: Interlobular pleuritis (right); early broncho-pneumonia (right).

Alimentary System: Chronic perihepatitis; chronic venous congestion of the liver; chronic hepatitis.

Genito-Urinary System: Chronic capsulitis of the kidneys; acute tubular nephritis; juvenile genitalia.

Glandular System: Remains of fetal lobulations of the spleen; chronic perisplenitis; chronic trabecular splenitis; peribronchial adenitis.

In the microscopical study of sections from heart, liver, kidney and spleen, stained by Noguchi's modification of Levaditi's method, spirochaeta pallida were found in the connective tissue and adventitia of some of the blood vessels.

Head: Is covered with coarse, black hair. The scalp is a little thicker than normal, contains considerable fat. The skull is very hard, almost ivory-like. Diploe is scant. The dura is firmly attached to the calvarium and to the underlying membranes for a distance of 5 cm. on either side of the great fissure. There is marked edema of the subarachnoid space. The small veins over the cerebrum are intensely congested. The pia-arachnoid shows a moderate amount of general thickening, considerably more marked over the sulci. There is practically no thickening over the tips of the occipital lobes, but it is marked over the entire base, especially just back of the chiasm and over the pons and medulla. The pial thickening is well marked on both the inferior and superior surfaces of the cerebellum. The ependyma of the floor of the fourth ventricle and middle portion of the floor of the lateral ventricles is distinctly grandular. The vessels at the base show no thickening. The convolutions in both frontal regions are narrow with broad sulci. Those in the parietal region are broad. The cortex generally is firm. Weight of brain, 1,300 grams.

Spinal Cord: Shows general congestion of the vessels and feels firm to the touch.

After hardening the brain and cord in 10 per cent. formalin, sections were taken from the right inferior frontal convolution, the right precentral gyrus, the right calcarine region, the right hippocampal region, the cerebellum, second cervical segment, mid-thoracic and lumbar regions, the left optic and third nerves and the choroid plexus.

After dehydrating, imbedding in celloidin and sectioning, these tissues were stained with hematin and eosin; thionin; Unna plasma cell method; modified Weigert's; and Noguchi's modification of Levaditi's stains.

Microscopical Examination: Section from right inferior frontal convolution: The pia-arachnoid is about three times the normal thickness, its vessels are thickened and their perivascular lymph spaces packed with lymphocytes and plasma cells. The vessels of the cortex are increased in number and the walls of the larger ones show proliferation of the intima and adventitia. The perivascular infiltration is even more marked than in the pia. (These changes are best shown in sections stained by Unna plasma cell method). All the layers show very marked cell devastation. In the third, fourth and fifth layers, a few apparently swollen nerve cells with very large eccentrically placed, faintly staining nuclei are seen. Here and there groups of neuronophages with the shell of a nerve cell are seen. The glia cells are increased in number and stain deeply. With Weigert's modified stain, a few bands of degenerated nerve fibres are seen in the white matter, just beneath the gray layers. With modified Levaditi's stain, (counterstained with thionin), a good number of spiral organisms are seen in close proximity to the nerve cells. A few are inserted into the protoplasm of the cell. Many of the nerve cells contain amorphous brown, granular material. The glia cells and fibres show marked proliferation.

Sections from other portions of the cerebrum mentioned above gave the same general histological picture as that described for the inferior frontal cortex, except the changes were less marked and no spiral organisms could be found in the occipital cortex.

In the cerebellum, the arterial and pial picture resembles that described for the cerebrum. In addition, the cells of Purkinje are degenerated and many of them show two distinct nuclei and nucleoli (see drawing). Similar changes in these cells have been described in cases of juvenile general paresis by Straussler[21], Trapet[22], Rondoni[23], and Hough[24], and accepted

as evidence of defective development of the nervous system.

Sections from three levels of the cord show the following microscopic changes: Chronic thickening of the dura, arachnoid and pia, most marked over the upper cervical segments; perivascular infiltration

with plasma and lymph cells, marked everywhere; degeneration of the cells of the anterior horns, especially on the left side; degeneration of a few fibres in both crossed pyramidal tracts, many fibres in Lissauer's tract and the posterior root zone.

The small arteries in the left optic nerve show marked perivascular infiltration. With Weigert's modified technic, nearly one-half the fibres show degeneration.

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DISCUSSION

Dr. Edw. F. Leonard, Chicago, Ill.: Some time ago I reported one case of juvenile paresis. The father of the patient was a syphilitic. Now there have been about 250 cases on record of juvenile paresis and I really believe there are more. The report of feebleminded admitted to institutions in 1910 were over 60,000 with all kinds of psychoses; 327 were under 15 years of age; 17 of these had general paresis, 11 males and 6 females between the ages of 1 and 19; 2,539 patients were admitted; 47 of these were general paresis. I remember one case in which the sister had goiter and syphilis; the mother a positive Wassermann; the father a positive Wassermann, and the boy finally died of general paralysis.

Dr. Tom A. Williams, Washington, D. C.: It does not seem every syphilitic becomes a general paretic. The work of the medical school conducted for the last three years seems to show that there are at least 3, possibly 4, distinct strains of spirochaetes which have different reactions and elect different portions of the nervous system. That, of course, is not settled, but it becomes an interesting problem at present in the efforts to find the etiological factor of paresis.

In the early conception of paresis, it was thought to be a frontal lobe conception, whereas a careful examination tends to show that it is a general invasion and sometimes, indeed, invades the projection areas more extensively than the association areas. There was in this case, as happened, a relative sparing of the occipital area, just as in some other cases there may be a sparing of any area, none in particular, but some area. We do not know why a particular area should be more spared than another—and it seems to me that we are not able to lay down any law that general paresis is a disease of any particular region.

Dr. Thos. H. Leonard, Lincoln, Ill.: It is my opinion that juvenile paresis is by no means as frequent in occurrence as paresis in adults. It is, however, more common than the reported number of cases would indicate. My deductions are based upon experience with the feebleminded. Before the time of the Wassermann, syphilis was considered as an unimportant etiological factor in its relation to feeblemindedness, such an authority as Ireland stating there was only a relationship in 1 or 2 per cent of the cases. We now, with the aid of the Wassermann, believe that a fairer percentage would be between 6 and 8 per cent. At the present time we have on record 169 positive Wassermann's on the blood of our children; 28 positive spinal fluids; and 17 in whom the blood and spinal fluid were both positive. Of this number seven have shown well marked symptoms of juvenile paresis, and in one of this number we have been able to sustain our diagnosis by histological examination of the brain, and hope that we may be able to report at a later date on all of these cases.

I am convinced that a number of cases are not diagnosed, especially so in a routine examination when the Wassermann is not made. In the past only those cases that showed the characteristic evidences of congenital syphilis were suspected as possibilities for juvenile paresis, while as a matter of fact we find syphilitic cases with those signs are only a small number of the total.

It should also be borne in mind that cases on entrance who do not give evidence of juvenile paresis may later develop this condition and escape detection. The frequency with which speech defects, inco-ordination, spastic paralysis and other neurological findings that occur in juvenile paresis are met with in non-syphilitic feebleminded children makes differential diagnosis very difficult. I believe by following up the cases that give positive Wassermann upon their blood, we will be able to diagnose juvenile paresis where it has previously escaped notice.

REPORT OF A CASE OF BILATERAL LENTICULAR DEGENERATION.*

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A definite symptom complex for lesions of the lenticular nuclei was established by Wilson,[1] in his comprehensive monograph in 1912. Since that time, Cadwalader[2], Hamilton and Jones[3], Farnell and Harrington[4], have reported cases with necropsy, and Sawyer[5], a case without autopsy, which fulfill most of Wilson's requirements.

Cadwalader[6] and Spiller[7] have recently called attention to the relation of pseudosclerosis to lesions of the lenticular nucleus, and Rhein[8] has reported a case of extra-pyramidal paralysis with a lesion in the lenticular nucleus.

Time will not permit us to attempt to further review the literature of these interesting lesions.

We wish to report a case showing some of the symptoms of Wilson's syndrome associated with a residual paralysis, in which at autopsy lesions of both lenticular nuclei were found.

G. W., male, white; age 56 years; admitted to Central Indiana Hospital, August 20, 1914.

Family History: A maternal uncle was paralyzed for six years, and died at the age of 84; two of his daughters (cousins of our patient) suffered with progressive paralysis of four and five years' duration, beginning before their 60th year. Patient's father died suddenly at 52 years of age from "heart failure." Mother was paralyzed at 69 and during the six years she lived, showed many of the same symptoms as our patient. One brother died at 70 years, after suffering with a progressive paralysis for three years; his son (nephew of our patient), became insane at the age of 23 and died in a state institution three months later. A sister died at 64 years, after being paralyzed for a few weeks. A brother, after suffering for two years with a paralysis characterized by remissions and relapses, died at the age of 65 years. A brother, while preaching, developed paralysis of the tongue. During the next five years the paralysis gradually extended to all parts of his body. He died at 60 years of age. Two brothers, 58 and 52 years respectively, are living and in good health.

Personal History: Our patient was the sixth child in a family of seven. Early life was uneventful. He graduated from college; taught school; became a finisher in a furniture factory; a commercial traveler; a lawyer; a life insurance agent, and finally a practitioner of "Manual Healing." Used tobacco to excess. There is no history of venereal disease, or of excessive use of alcohol. Married at the age of 32 years and became the father of two children.

Patient's present illness began September 6, 1911, when on attempting to get up, he found his right side paralyzed and that he could not speak distinctly. He improved rapidly and in six weeks was practically normal. However, he was unable to resume his "Manual Therapy," on account of inability to use his hands effectively. On August 12, 1912, his left side was paralyzed. In a short time, he partially recovered but had to use a cane to get about. He became peevish, fretful, depressed, and developed ideas of persecution. He threatened suicide, and would laugh or cry without apparent cause. He was sent to the City Hospital for a short time and admitted to the Central Indiana Hospital, August 20, 1914. At this time, he showed the residuals of a left sided paralysis without contractions. His face was mask-like and expressionless. His deep tendon reflexes were exaggerated, a little more so on the left side, and the muscles of his extremities spastic. There was some ataxia. Coarse tremors of the muscles of the extremities and face were present when voluntary movements were attempted. Dysarthria and dysphagia were present to a slight degree, making the speech slow, and attempts at swallowing difficult. There was no evidence of cranial nerve involvement. Examination of the thorax and abdomen was negative. Wassermann reaction on the blood serum was repeatedly negative, and all tests (globulins, cell count, and Wassermann reaction) of the spinal fluid including the colloidal gold test, were negative.

During his residence in the hospital he gradually became more and more spastic; his dysarthria so marked that his attempts to speak became mere jumbles of partly articulated words; his swallowing so difficult that only liquid food could be taken, and finally, he was unable to swallow at all. Emotionally, he was very unstable, laughing or crying, at times a combination of both, without apparent cause. When his speech was not understood by the physicians or attendants, he became very angry. He never manifested any hallucinations or delusions; his attention was easily held; was well oriented, and there was no apparent dementia until a short time before his death. During the last three weeks of his life, he became so spastic and so weak that he was confined to bed. Death from exhaustion occurred at 4:40 p. m., April 21, 1915.

Autopsy, one and a half hours, post mortem. No contractures or atrophies are present. The organs of the body cavity are of but little interest and only their pathological diagnosis will be considered here.

Chronic pericarditis; mitral stenosis; moderate atheroma of the aorta; edema, congestion and old healed tuberculosis of lungs; moderate chronic perihepatitis; moderate perilobular cirrhosis of liver; chronic interstitial pancreatitis; chronic interstitial nephritis; chronic hyalo and trabecular splenitis.

*Read before the fifth annual meeting of Alienists and Neurologists at Chicago, June 23, 1916.

At necropsy, the brain showed a moderate diffuse leptomeningitis; moderate dilatation of lateral ventricles and distinct softening to the touch, of the nuclei forming the floor of the lateral ventricles. The cerebral vessels showed a slight general thickening. After hardening the brain in 10 per cent formalin, longitudinal sections were made, beginning at the level suggested by Marie.

On the right side an area of softening (4x2 mm) involves the posterior edge of the caudate nucleus, the lenticular nucleus and the anterior limb of the internal capsule. A similar larger area (7x2 mm) involves the putamen and inner edge of the external capsule; and a triangular zone of softening (5 mm) is found in the globus pallidus, just external to the genu of the internal capsule. Grossly, this last area seems to involve the fibres in the posterior limb of the internal capsule.

On the left side, small areas of softening are scattered through the lenticular nucleus, especially in the putamen, giving it a honeycomb appearance.

Section of the pons reveals a small area of necrosis in the pyramidal fibres.

Microscopical Examination: Sections from various areas of the cortex, stained with hematin, eosin, Van Gieson and thionin, show no infiltration of the membranes or about the small vesesls, and only slight changes in the nerve cells. Sections from the right cerebral peduncle, the pons, medulla and cervical cord, stained by Weigert's method, show degenerations in the fibres making up the right pyramidal tract. Sections through the basal ganglia on both sides, examined under low power, show the lenticular nuclei to be made up of numerous irregular, scattered necrotic areas. These areas of softening vary in size, are larger in sections from the right lenticular nucleus, but more numerous in the putamen on the left side. Many of the necrotic areas appear as zones of debris, granular cells, and neuroglia cells arranged about a small artery. Other areas have no relation to the blood vessels. The vessel walls are not thickened and there is no evidence of perivascular infiltration. One of the larger softened areas in the globus pallidus on the right side extends into the anterior third of the posterior limb of the internal capsule. With Weigert's stain, the fibres in this area are degenerated. The nerve cells in the lenticular nuclei seem less numerous than usual and many of them are crowded with coarse, yellow granules.

Summary: Our patient comes from a family having what appears to be a very bad vascular history, though none of the cases were confirmed by autopsy. The patient suffered first with a right sided hemiplegia, with recovery, and no evidence of a lesion was found at necropsy. His second paralysis, coming on eleven months after his first attack, involved the left side. From this, there was only a partial recovery. He gradually developed volutional tremors, spasticity, dysarthria, dysphasia and an emotional instability. Death occurred three years and seven months after his first attack, and the autopsy revealed areas of degeneration in both lenticular nuclei, the right caudate nucleus, and right internal capsule, without marked vascular changes. Microscopically, the liver showed perilobular fibrosis.

Our case differs in some respects from the clinical and pathological picture described by Wilson, but on account of the pathological findings without marked vascular changes, should be classified as a case of bilateral lenticular degeneration with involvement of the pyramidal tract.

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DISCUSSION

Dr. G. W. Robinson: The doctor says that the patient did not have exactly Wilson's syndrome, but that he had involvement of other areas outside of the Wilson syndrome, involvement of the pyramidal tracts. These paralytic conditions affecting the motor functions can and do give positive symptoms. These lesions of the pyramidal tract really can give but the negative symptoms, symptoms of true paralysis. We know, according to Wilson and various other investigators, that there is a disturbance of function outside of the pyramidal tract, affected secondarily, giving positive rather than negative symptoms. I thank the doctor for his presentation. It is a subject we should study more. There are so many things we don't undertsand: Motor function and where we can locate the lesions. These papers are of value because they make us think. I presume you have all read Wilson's report in *Brain*? If any are present who have not read it, after reading this paper it will be valuable to read that very carefully.

Dr. F. C. Potter: I do not want to add to my paper. I was talking to Dr. Singer yesterday in the hope that he would be here to discuss the paper but he told me he could not, but made a suggestion that seemed to me new and extremely interesting. He agreed with me that this case was not vascular, showing actual changes in the blood vessel wall, but made the suggestion that primarily there must be an inflammation involving the vascular wall; that this inflammation was more marked at first on the left side, causing a right-sided paralysis; it was not sufficient to cause actual destruction and consequently we got recovery of the paralysis of that side. This second inflammation was sufficient to destroy the cells and fibers on the right side and cause the paralysis. He spoke of Rosenow's work in connection with specific reactions for certain groups of organisms. We know

that Rosenow has found certain kind of streptococci seeming to have an affinity for the tonsils and no matter what animals they are injected into they give the same pathology. His suggestion was that the inflammation primarily was due to some such infection. I think it is worth considering.

Dr. G. W. Robinson: I want to add one thing to the Doctor's remark concerning the discussion with Dr. Singer. Speaking of organisms, I recently had in my care a man, 64 years of age, who came to me with a left-sided paralysis. He could not dress himself; he had thickening of the tongue; face paralysis. A year prior to coming to me he had a tooth filled. During that time he had an abscess at the base of the tooth. He had it opened without stopping the condition. On examining the pus we found the streptococcus organism. He had the tooth extracted and within ten days he was absolutely well. It was not a pyramidal paralysis; it was not a spastic paralysis. It was a flaccid paralysis and yet that man was absolutely helpless. Also his mentality was lessened—his mental activity. It shows what these infections will do and that taught me a great deal about the teeth and what a little bit of infection can result in.

EDUCATION OF THE FEEBLEMINDED.*

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Every public institution for the feebleminded in the United States was started by urging the plea to the legislatures that such an institution would educate the mental defective out of his deficiency and make him a self-supporting and productive citizen, and it was years before the fact was recognized that mental deficiency is a condition and not a disease like insanity, and the only help possible is an alleviation of the amount of defect by education. We can relieve and improve the defective, but we can never cure him.

Now opinions differ as to just how far it is well to educate these individuals in a literary sense. My own personal belief after twelve years of experience in caring for and training these people is that we all teach far too much along literary lines and far too little along vocational lines. Practically every child so defective as to go to a public institution for feebleminded to get its training should remain in the care of that institution for the rest of its life; and, as a matter of fact, the greater part of them do so. Now the demands of a feebleminded person living in an institution for anything of a literary character are exceedingly small. Very few of the older and brighter inmates of a home for the feebleminded read the newspapers, and those who do love most the murder trials and police court records, but give mighty little attention to current events. They are fond of love stories and detective stories, but seldom or never read poetry, history or biography. In fact, any reading, unless carefully watched and cultivated, is extremely desultory and only occasionally indulged in. Of arithmetic they need only so much as will enable them to do the simple tasks assigned them in the institution.

It is astonishing how few of our inmates keep track even of the day of the month and the year. They have very little money to contend with, so why attempt to teach them to compute interest? Weights and measures would be of more value to them were they able to estimate relative values. As a matter of experience, we found that we can trust but few of our inmates, however bright, to weigh or measure anything with accuracy.

One powerful reason for a certain amount of literary training of the defective lies in the desire of the fathers and mothers, friends and relatives of these people that they have schooling, demanding that they be at least tried in school; and I believe a reasonable amount of satisfaction is due these parents and friends.

It is still unfortunately true that the family doctor will persuade a mother or father to send a defective child to the institution on the false statement that the institution will "cure" the defect after a few years of education. These people must themselves be educated to the fact that there is hope only of relief. But meanwhile they demand, and if they are to leave the child where it belongs, must have, literary training for that child.

Writing and spelling sufficient to write home should be given, but beyond these elementary things I do not believe literary training for the feebleminded should be carried. But when we come to consider the vocational features of educational training we have quite a different field. And by vocational training I do not mean at all the sort of vocational training that would be given to grammer or high school boys and girls, but the sort of manual training that will fit the feebleminded boy or girl to take his or her place in the community life of the institution. The

*Read before the fifth annual meeting of Alienists and Neurologists at Chicago, June 20, 1916.

boys should be trained in paper cutting and sloyd because proficiency in those things makes them better helpers in the shops, gardens, and on the farm. The girls should be trained in dish-washing, sewing, laundry and general housekeeping because here is the field of their future industry. I believe also in a certain amount of fancy work and lace making because these furnish amusement to these non-reading girls and women, but I do not believe in the fancy work training carried to the extent it sometimes is in institutions to the exclusion of education along practical and useful lines.

The uselessness of spending time to teach a very defective child along literary lines was shown by a girl, or woman, rather, living yet, I believe, in the large institution at Waverley, Mass.; this woman would test, I am sure, about five or six years old and could, when I was there in the institution, spell readily probably over a hundred words, which she had been slowly and laboriously taught many years ago, but the curious part of it was that she could as readily spell every one of those words backward. She was quite unable to define any of them; that is, the words meant to her only an assemblage of sounds, and not ideas at all. It is only fair to Dr. Fernald to say that no such effort as teaching a low grade imbecile to spell is attempted there today. This same woman had been taught to do certain elementary household tasks quite well under the supervision given her in the school.

The one fact to remember is that all the training we can give, whether literary or manual, can only help the defective to do some things better than he will without such training, and that all the training that can possibly be given will not furnish him with judgment, self-control, or sufficient common sense, to take his place in life as a responsible human being. His only chance of becoming at all self-supporting is in an institution, under trained supervision and careful oversight, where sufficient allowance is made for his short-comings, and sufficient direction and help given him to enable him to perform his tasks well.

I believe that the farm colony plan is the very best proposition known for providing practical employment for the feebleminded boy and man, and perhaps for the girl and woman.

Provide one good educational institution in each state and then send these people, when they have been trained, out on a farm where they can live in health and usefulness, the only life for which the feebleminded are fitted.

DISCUSSION

Dr. Sawyer: Dr. Bliss has brought out two great truths in his paper. One is that you cannot cure the feebleminded. You are spending a great deal of energy in trying to get them well. As I said a couple of years ago: You must consider these people against the normal. The normal people have twenty-six letters in their alphabet, whereas the feebleminded have five or ten and they can only make that many combinations. The next point, that their training must be vocational. These people are going to be the drawers of water; you cannot change them; they never will be the time-keepers and it is useless to make them such. You must teach them things that they can do so that they can make themselves of as much value as possible. In a great many instances it will be very little. If they can become "one per cent" or "five per cent" people you have helped them a little bit.

Dr. Bliss (closing): About one per cent of the children who enter school are able to go to college, and yet every bit of our system of public school education, until within a few years, has been on the assumption that every child that entered school would enter college. I think 90 per cent of the children who leave grammar school leave with what literary work they can get, what work in numbers they can get, but with not one lesson of the practical things of every-day life. They are absolutely untrained so far as their ability to do things is concerned. I believe that is one of the most primary faults of our educational system today, and it is rather remarkable that for a great many years before any movement was made toward vocational education of children in public schools the institutions for the feebleminded had found that they had to train these children in their own work, and so the institutions for the feebleminded have been teaching vocational training and they have been better taught than anywhere else and this is a fact that is not generally understood or recognized.

A PRELIMINARY WELFARE REPORT OF CASES RECENTLY DISCHARGED FROM THE WATERTOWN STATE HOSPITAL.*

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Believing that a study of the effect of home environment would be interesting and beneficial, the author has prepared a partial report on cases

*Read at meeting of the State Hospitals Association at Peoria, Oct. 26, 1916.

WELFARE REPORT OF PAROLED PATIENTS.

Psychosis—	Duration of Attack.	Mos. Absent	Condition on Discharge.			Adaptation.	Signs of Subsequent Attack.	Self-Supporting. W—Wholly. P—Partial. D—Dependent.			Friends' View of Case. N—Normal. I—Improved. U—Unimproved.		
			R	I	U			W	P	D	N	I	U
Dementia præcox	6 months	4	R			Yes	No		P		N		
Dementia præcox	12 months	4		I		Yes	No		(P)			I	
Dementia præcox	14 months	2		I		Yes	No		P			I	
Dementia præcox	8 years	3		I		Yes	No		(P)			I	
Dementia præcox	?	15		I		Yes	No	W				I	
Dementia præcox	?	8		I		Yes	No	W				I	
Dementia præcox	12 months	14¾		I		Yes	No		P			I	
Dementia præcox	3 weeks	15¾		I		Yes	No	W			N		
Dementia præcox	1 week	5		I		Yes	No	W				I	
Dementia præcox	3 years	5¼		I		Yes	No		(P)		N		
Dementia præcox	1 month	6		I		Yes	No	W			N		
Dementia præcox	18 months	15½		I		Yes	No		P		N		
Dementia præcox	20 months	7½		I		Yes	No			D		I	
Dementia præcox	8 years	10¾		I		Yes	Yes	W				I	
Dementia præcox	1 week	2¾		I		No	No		P			I	
Dementia præcox	?	3		I		Yes	No	W			N		
Total			1	15		+15 —1		7	8	1	6	10	
Allied to dementia præcox	5 years	8½		I		No	No			D			U
Allied to dementia præcox	1 year	14¾			U	Yes	No		(P)		N		
Allied to dementia præcox	6 months	4		I		Yes	Yes	W				I	
Total				2	1	+2 —1		1	1	1	1	1	1
INTOXICATION.													
Acute, alcohol	3 weeks	2	R			Yes	No	W			N		
Acute, alcohol	6 months	4	R			Yes	No	W			N		
Chronic, alcohol	2 years	1		I		Yes	No	W			N		
Chronic, alcohol	?	11		I		No	Yes		P			I	
Chronic, alcohol	?	15½			U	Yes	No	W			N		
Chronic, alcohol	2 years	1¾		I		Yes	No	W			N		
Chronic, alcohol	3 months	1		I		Yes	No	W			N		
Chronic, alcohol	2 years	10½		I		Yes	No		P			I	
Chronic, alcohol	20 years	7½	R			No	Yes		P			I	
Chronic, alcohol	1 month	3		I		Yes	No		P			I	
Hallucinosis, alcohol	?	17½		I		Yes	No	W			N		
Paranoia, alcohol	8 months	12		I		No	Yes			D			U
Morphinism	5 years	6	R			No	Yes			D		I	
Morphinism	24 years	13½		I		Yes	Dead		P		N		
Morphinism	6 years	16¾	R			Yes	No	W			N		
Morphinism	18 years	16½		I		Yes	No		P		N		
Morphinism	1 month	15¾		I		Yes	No				?		
Morphinism	10 years	1		I		Yes	No		P		N		
Morphinism	1 year	3	R			Yes	No	W			N		
Morphinism	1 month	5		I		Yes	No	W			N		
Total			6	13	1	+16 —4	+4 —16	10	7	2	13	5	1
Manic, depressive	4 years	15½		I		Yes	No	W			N		
Manic, depressive	2 weeks	5	R			Yes	No	W			N		
Manic, depressive	3 months	4	R			Yes	No	W			N		
Manic, depressive	2 months	6		I		Yes	No		P			I	
Manic, depressive	4 months	4		I		Yes	No		(P)		N		
Manic, depressive	20 years	13		I		No	Yes		(P)			I	
Manic, depressive	8 months	19¼		I		Yes	No		(P)		N		
Manic, depressive	1 week	12		I		Yes	No	W			N		
Manic, depressive	6 months	1		I		Yes	No	W			N		
Manic, depressive	2 months	10		I		Yes	No		(P)		N		
Manic, depressive	4 days	7¾		I		Yes	No	W			N		
Manic, depressive	3 months	7½		I		Yes	No		P		N		
Manic, depressive	1 week	15½		I		Yes	No	W			N		
Manic, depressive	1 week	3	R			Yes	No	W			N		
Manic, depressive	2 years	3	R			Yes	Dead			D	N		
Manic, mixed	4 years	4	R			Yes	No		(P)		N		
Total			5	11		+15 —1	+1 —15	8	7	1	14	2	
Mental defective	Life	3		I		Yes	No		P			I	
Mental defective	?	4		I		Yes	Yes	W			N		
Mental defective	5 years	4		I		Yes	No	W			N		
Mental defective	5 years	16		I		Yes	No	W			N		
Mental defective	2 months	9¼		I		Yes	No	W			N		
Mental defective	4 years	6		I		Yes	Yes		(P)		N		
Mental defective	6 months	10½		I		Yes	Yes	W				I	
Mental defective	1 week	16		I		Yes	No		P		N		
Mental defective	?	3		I		Yes	No		(P)			I	
Total				9		+9	+3 —6	5	4		6	3	
ORGANIC BRAIN DISEASE.													
Senile	2 years	2		I		Yes	Yes			D		I	
Arterio-sclerosis	10 years	3		I		Yes	No	W			N		
Arterio-sclerosis	5 months	13½		I		Yes	Yes			D		I	
General paralysis	2½ years	14¾			U	No	Dead			D			U
Undifferentiated	2 weeks	11¼		I		Yes	No		(P)		N		
Total				4	1	+4 —1	+2 —3	1	1	3	2	2	1
Unclassified	2 months	3		I		Yes	Yes	W			N		
Unclassified	13 years	3		I		Yes	No			D		I	
Unclassified	4 years	4		I		Yes	No		P			I	
Unclassified	1 month	4	R			Yes	No	W			N		
Unclassified	2 months	3	R			Yes	No	W			N		
Unclassified	1 week	14		I		Yes	No	W			N		
Unclassified	8 years	10½		I		Yes	No		(P)		N		
Unclassified	2 years	1¾		I		Yes	No		P			I	
Unclassified	8 years	11		I		Yes	No		(P)		N		
Unclassified	?	5¼		I		Yes	Yes	W			N		

Unclassified	2 months	8	.....	I	.....	Yes	No	W	.....	.....	N	.....	.....
Unclassified	1 month	13	.....	I	.....	Yes	No	W	.....	.....	N	.....	.....
Unclassified	4 weeks	14¾	.....	I	.....	Yes	No	.....	(P)	.....	N	.....	.....
Unclassified	1 year	17½	.....	I	.....	Yes	No	W	.....	.....	N	.....	.....
Unclassified	9 months	10½	.....	I	.....	Yes	Dead	.....	P	.....	.....	.....	.....
Unclassified	4 years	12	.....	I	.....	No	Yes	.....	.....	D	.....	.....	U
Unclassified	3 months	12¼	.....	I	.....	Yes	No	.....	P	.....	N	.....	.....
Unclassified	1 month	5	.....	I	.....	Yes	No	W	.....	.....	N	.....	.....
Unclassified	?	14¼	.....	I	.....	Yes	No	W	.....	.....	N	.....	.....
Total			2	17	.....	+18 —1	+3 —16	10	7	2	14	3	1
ANXIETY GROUP.													
Pre-senile	3 months	4	.....	I	.....	Yes	No	.....	(P)	.....	.....	I	.....
Invol. melancholi	7 months	6¼	.....	I	.....	Yes	Yes	.....	(P)	.....	.....	I	.....
Total			.....	2	.....	+2	+1 —1	.....	2	.....	.....	2	.....
PSYCHOGENIC.													
Psychesthenia	3 years	16¼	.....	I	.....	No	No	?	.....	.....	?	.....	.....
Neurasthenia	?	8	.....	.....	U	No	Dead	?	.....	.....	?	.....	.....
Hysteria	2 weeks	10½	.....	I	.....	Yes	No	.....	(P)	.....	N	.....	.....
Allied to hysteria	3 years	3	.....	I	.....	Yes	No	.....	(P)	.....	N	.....	.....
Total			.....	3	1	+2 —2	—4	.....	2	.....	2	.....	.....
Locomotor ataxia	1 year	2¾	.....	I	.....	Yes	No	W	.....	.....	.....	I	.....
Psychopathic personality	1 week	7	.....	.....	U	Yes	Yes	W	.....	.....	.....	.....	U
Not insane	?	9	Not insane			Yes	No	W	.....	.....	.....	.....	.....
Not insane	?	10¾	.....	I	.....	Yes	No	W	.....	.....	.....	I	.....
Epilepsy	1 year	6	.....	.....	U	Yes	Yes	.....	P	.....	.....	I	.....
Epilepsy	20 years	2	.....	.....	U	Yes	Yes	W	.....	.....	.....	I	.....
Total			.....	2	3	+6	+2 —2	5	1	.....	.....	4	1
	Not reported	.....	1	.....	.....	.....	.....	.....	.....	3	.....	.....	5
Grand total			14	78	7	+89 —11	+19 —81	47	40	10	58	32	5

recently discharged. There have been four hundred and thirty-four patients discharged from this institution within the last eighteen months. I have taken one hundred of this number, as a basis for my first report.

Form letters were mailed to one hundred and forty-six relatives. To date we have heard from nearly one hundred. Relatives were asked to fill in an enclosed letter in answering questions and to return it within thirty days. The following are the questions asked: "How has John Doe been getting along since he left the hospital?" "Do you notice anything in particular which suggests he is not well?" "Does he entertain any peculiar ideas?" "Does he do any work and is he self-supporting?" "Do you consider him recovered?"

The majority of the cases belong to the dementia praecox, intoxication and manic-depressive groups. Five of the one hundred cases are considered unimproved, thirty-two improved and fifty-eight recovered from the acute attack, as the result of hospital treatment. Eighty-nine are adapting themselves to their environment, nineteen show signs of subsequent attacks, forty-seven are wholly self-supporting, and forty are partially self-supporting.

The cases have been separated into groups, according to what type of reaction they presented while in the institution. The dementia praecox group contains sixteen cases, allied to dementia praecox three, intoxication group twenty, two acute and eight chronic alcoholics, one alcoholic hallucinosis, one alcoholic paranoia, and nine cases of morphinism. The manic-depressive group contains sixteen cases, the mental defective nine. The organic brain disease group contains one senile dement, two arterio-sclerotics, one paresis and one undifferentiated. There are nineteen unclassified cases. One each of pre-senility, involutional melancholia, psychasthenia, neurasthenia, hysteria, allied to hysteria, tabes, and psychopathic personality. There are two epileptics and two not insane. All of these were residents of the hospital less than one year and have been absent for periods varying from one to nineteen and a quarter months. The duration of the psychosis varied from three days to twenty years.

Seventy-eight cases were discharged as improved, fourteen as recovered, and seven as unimproved. Since leaving the hospital eighty-nine have been adjusting themselves. Only eleven have not been able to adapt themselves to the old environment. About one-fifth or nineteen per cent show signs of subsequent attacks.

It is unjust to women who have families to care for, and whose only means of livelihood is in the home, to be called partially self-supporting. I have therefore designated them as partially self-supporting, but with a bracket enclosing the term. Forty-seven per cent make their own living. To this should be added the nineteen per cent of housewives who are partially self-supporting; twenty-one per cent depend on others for partial support, while only ten per cent are wholly dependent.

From the study of the cases thus far, one can readily see that the majority of the patients seem

to have been benefited by hospital treatment. Now let us consider this report from a different viewpoint. Let us compare the condition of patients on discharge, with the relative's opinion of the case. Fifty-eight per cent, relatives consider normal, thirty-two per cent are improved, and only five per cent are still unimproved, as against fourteen per cent recovered, seventy-eight per cent improved and seven per cent unimproved, as shown by the hospital records.

Of the sixteen cases of dementia praecox discharged, the relatives consider six as "normal" and ten improved. The hosptal discharged one as recovered and fifteen as improved. This means one of two things. Either the relatives are less observing and have become accustomed to the patient's abnormal reactions or that improvement has continued after leaving the institution.

In the allied to dementia praecox group, one patient discharged as unimproved is considered normal by relatives. One case was discharged as improved, but is still considered unimproved by relatives. In the intoxication group we find but one, an alcoholic paranoic, who, though he was discharged as improved, has followed the path of least resistance and is now wholly dependent and unimproved.

A morphine habitue of twenty-four years' standing was improved, got along nicely on the outside, did not go back to his old habit, was partially self-supporting, and was considered recovered. But one manic shows signs of subsequent attack, but according to the history the psychosis was of twenty years' duration. She is not adapting herself, though she is considered improved. It is doubtful whether this was really a case of manic-depressive insanity.

The mental defectives were all discharged as improved. Six are now considered recovered from the attack. In spite of the fact that one case still shows signs of a subsequent attack, he is considered normal. Another adapts himself well, shows signs of future disturbance, is wholly self-supporting, yet is considered as normal.

Under the organic brain disease group we notice a case of arterio-sclerosis of ten years' duration. He adapts himself well, shows no signs of subsequent attacks, is wholly self-supporting, and is considered normal.

Two cases left unclassified were discharged as recovered, seventeen as improved. All but one are adapting themselves, but three show signs of subsequent attacks. Ten are wholly, seven only partially self-supporting, two are wholly dependent. Fourteen are considered recovered, three are improved and one unimproved.

The anxiety group contains two cases, both are considered improved. They are both housewives, are partially self-supporting, both are adapting themselves well. The case of involutional melancholia, however, shows signs of subsequent attack. Neither the case of psychasthenia, nor the neurasthenic have adapted themselves well. The case of hysteria and one allied to this condition were discharged as improved, and have since recovered. They are adapting themselves, show no signs of subsequent attack, and are partially self-supporting.

A case of tabes is wholly supporting, has markedly improved, has continued his treatment since leaving the hospital and has had good results. The psychopath is still unimproved. He is wholly self-supporting and still shows signs of subsequent attack. One case diagnosed as not insane was discharged as improved. This patient was a voluntary case who was admitted under the influence of alcohol; he remained only a few days, but his general condition on leaving was much improved. Both epileptics were discharged as unimproved. One is wholly, the other partially supporting. Both are adapting themselves and show signs of a subsequent attack.

The larger number of cases are either improved or again normal. You no doubt are raising the question, "Are all patients who appear normal to relatives really recovered?" To this question we reply emphatically, "No." Because we realize that relatives are not impartial in judging their friends, we have devised a scheme whereby we may better judge the mental condition of our parole patients. After three months' parole has expired relatives to whom a patient has been paroled, are required to return him to the hospital before being discharged. We discuss with both patient and relatives his former disturbed mental poise, what he has been doing since on parole, and his plans for the future. Having shown that he is to all appearances improved or recovered, he is then discharged as such. If he shows signs of a recurrent attack, he is kept for observation a week or more. The adoption of this plan will, we believe, eliminate much of the embarrassment brought on the in-

stitution due to our discharged patients violating society's conventions.

A report on a small number of cases is obviously not as conclusive as would a large series be, but the author believes that enough facts have been brought out to prove that such a report on all cases would be of much value.

A CASE OF ALCOHOLIC POLYNEURITIS WITH UNUSUAL TROPHIC DISTURBANCES.

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Trophic disorders are not a common occurrence in polyneuritis. While they may appear in the form of blisters, glossy skin, herpes like eruptions, etc., yet they do not dominate the clinical picture of this disease, like the motor, sensory or even psychical symptoms. In the present case, the trophic, motor, sensory and psychical disturbances were not only equally represented, but the former, i. e., the trophic symptoms, actually predominated, were the early manifestations of the polyneuritis and attained an unusual degree of severity. In fact, they so obscured the clinical picture that the disease evidently remained unrecognized for eleven years.

History: Man 40 years old, cattle butcher by occupation, entered my service at the Cook County Hospital, September 8, 1916, complaining of weakness and soreness in the feet. He denies syphilis, malaria, any other infectious or contagious disease, but admits having been drinking large quantities of beer and whiskey. He could give an excellent account of his early boyhood life, could give the name of his teacher, the street number of the house where he lived 30 years ago, but was very uncertain in regard to more recent events of his life. Thus he could not remember the dates of various accidents that occurred in his life and confessed that his memory became rather "strange." He remembers well that he was in excellent health up to the age of ten, when he sustained an injury to the right thigh which resulted in a bony growth. This was removed about eight years later. Eighteen years ago he sustained another injury and lost two fingers of his left hand. About thirteen years ago he met with a third accident in a stock yards fire. He claims a viaduct fell over him, injuring his back, ribs, right ankle joint and toes. He was taken to a hospital, where he stayed for five weeks, then rested at home for about the same length of time, feeling perfectly well. He was not paralyzed, had no bladder or rectal disorders, no gait troubles, but the large toes, especially the left one, became "sore" about four months after the fire and began to ulcerate. The ulcers healed, opened up again, and finally after eight years of suffering and treatment he had the left toe removed. Soon after the operation—the exact date he does not remember—the rest of the left toes became ulcerated, and the right big toe became so bad that it had to be amputated about five months ago. The amputation was followed, he says, by ulcer formations on the rest of the right toes and of the soles of the feet. The toes became large, red, club shaped, assuming the aspect of that of the big toes, before they were amputated. About seven months ago he met with a fourth accident, in a street car, and this time the head was injured.

Examination: A strongly built man, with numerous signs of previously sustained injuries and operations. There are two skin scars on the forehead, a deep hole on the anterior surface of the right thigh from an operation twenty-three years ago, amputated thumb and index finger on the left hand, amputated large toes of both feet and a kypho-scoliosis. The remaining toes are greatly disfigured, club shaped, cyanotic or rather livid in color. The second toes, on both sides, are greatly increased in size, club shaped and ulcerated on the plantar surface. The remaining toes are less mutilated, are slightly cyanotic, the fourth toe on the right also showing an ulcer on the plantar surface (Fig. 1). The ulcers have the size of a dime and are somewhat drying. The toes are not only disfigured, discolored, but are paralyzed. The feet are drooping (Fig. 2) but normal in color, the ends of the first metatarsals being greatly thickened and increased in size. The left foot is slightly adducted, the extension, the out-inward movements being greatly impaired. The right ankle joint is devoid of any active or passive motility, as the joint is stiff, ankylosed. The legs are normal in color, the right calf muscles are wasted and sensitive to pressure like the left calf muscles and the large nerve trunks on both sides. The muscle power in the legs and thighs is retained on both sides,

Fig. 1. Mutilation and ulcerations of the toes.

but very much reduced in the extensors of the feet and toes.

The sensibility is markedly impaired on the dorsal and plantar surfaces of the toes and feet and somewhat on the external surface of both legs. The sensibility is lost for pain, temperature, touch. The pressure and muscle senses are merely diminished. The anesthesia principally involves the areas of the peroneus superficialis and profundus, does not end abruptly, but gradually enters the zone of hyperesthesia (Fig. 3).

The reflexes: the tendo Achillis reflex was lost on both sides, the knee jerks were present—on the right with reinforcement—the triceps reflexes were lively, the cremasteric present on the right, and very weak on the left, the abdominal was present above the umbilicus, absent below.

The gait was quite characteristic: the patient flexes too much the hips and the knee joints, while the feet are dangling—the so-called steppage gait.

The bladder, rectum, sexual power, internal organs, the cerebral nerves, the urine, serological tests, the sensibility above the legs were all normal.

The electrical examination of the peroneal, post. tibial nerves, extensors of the feet and toes did not reveal any reaction of degeneration, but showed mere quantitative changes.

The findings thus pertain exclusively to the abnormal condition of the feet, toes, right leg (atrophy of the calf muscles) and spine (kyphosis). The toes show a combination of trophic, vascular, sensory and motor disturbances, while the feet—sensory and motor defects, which were also present, though slightly, on the legs. Both motor and sensory disturbances could be very well explained by the bilateral involvement of the peroneal nerves, i. e., by a pure peripheral lesion in the form of a multiple neuritis. However, the presence of pronounced trophic disturbances of long standing suggested also the possibility of a posterior root involvement. i. e., of tabes or a possible lesion of the spinal cord itself, of that portion of the latter where the peroneal nerves originate and where the sensory nerves pass that supply the feet and toes with sensation. This portion of the spinal cord comprises the two lowest lumbar and the two upper sacral segments, these four segments forming what Minor of Moscow, Russia, described as epiconus.

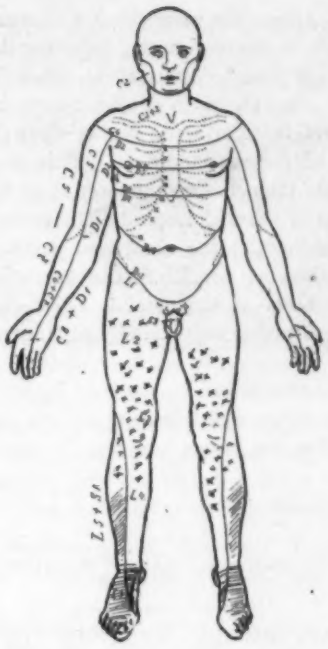
Of these three lesions—peripheral neuritis, tabes and epiconus lesion—tabes could be easily excluded. Tabes of the lumbosacral region generally gives very marked posterior root symptoms, as violent shooting pains, ataxia, severe genito-urinary disturbances, etc., which symptoms in this patient were absent. Besides, the negative serological findings in the blood and cerebrospinal fluid also speak against tabes. The pronounced trophic disorders of many years standing suggested, at first glance, the possibility of

Fig. 2. "Foot drop" and mutilated toes.

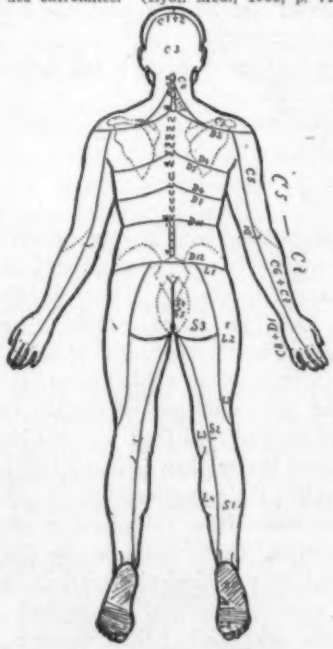
a central, i. e., a spinal cord lesion in the form of syringomyelia or spinal gliosis. In favor of this diagnosis spoke the numerous injuries and the kyphosis in the region of the first lumbar vertebra.

Syringomyelia or spinal gliosis involving the epiconus would very well explain the motor, sensory and trophic disturbances, because an epiconus lesion practically gives the same symptoms as presented by my patient: bilateral foot drop, steppage gait, loss of tendo Achillis jerks, sensibility disturbances, in the presence of normal knee jerks and of a normal function of the genito-urinary organs. Yet the character of anesthesia, the tenderness of the calf muscles and of the large nerve trunks, the amnesia and the alcoholic history spoke rather in favor of a multiple neuritis. The only difficulty was to explain the mutilations of the toes, their ulcerations, etc., which, as I mentioned above, are very uncommon and in fact exceptionally rare in polyneuritis. There was a report but of one case similar to mine that I could find, that of Lépine and Porot.[1] In their case a polyneuritis (alcoholic) was complicated by gangrene of the right index and of both middle fingers. There was severe paroxysmal pain in the affected fingers, but no sensory disturbances, no change in the reflexes, no muscular atrophy, etc.

1. Lépine et Porot: Névrite alcolique avec gangréne symétrique des extrémités. (Lyon Méd., 1905, p. 746.)



REMARKS



REMARKS

Fig. 3. Sensibility disturbances on the lower extremities

The disease started with severe pain two years previously, followed by a felon formation on the right middle finger. There was no history of trauma, no infection. A year later the left middle finger became involved, also followed by excruciating pains, and finally sloughed off.

In another patient a typical erythromelalgia was the complication of a neuritis. The patient died and the post mortem examination showed changes in the peripheral nerves.

Equally significant are the earlier observations of Pitres and Vaillard.[2] They carefully studied the possible histopathological changes in various nerves of the lower and upper extremities in cases of perforating ulcers of toes and feet. They found evidence of neuritis not only in the immediate vicinity of the ulcers, but in regions far removed. Thus, in case the toes were involved,

2. Pitres, A., and Vaillard, L.: Altèrations des nerfs périphériques dans deux cas de maux perforants plantaires et dans quelques autres formes de lésions trophiques des pieds. (Arch. de phys. normale et pathol., 1885, p. 308.)

the post. tibial, the external and internal poplíteals, the ant. peroneal nerve, including the sciatic nerve, were found degenerated. The difference between the condition of the nerves near the ulcers and those situated higher up was in the amount of regenerated fibres. This was larger the farther the nerve was removed from the ulcer. In a case of marked trophic disturbances in the hand (ichthyosis) the ulnar and median nerves showed signs of neuritis. The latter is looked upon by them as the possible cause of various trophic skin lesions, including gangrene.[3] It cannot, therefore, be doubted that the various trophic disturbances as observed in my patient were due to the multiple neuritis as a predisposing, and to the severe traumata as an exciting cause.

3040 Jackson Blvd.

3. Pitres, A., and Vaillard, L.: Contributions à l'étude des grangrènes massives des membres d'origine névritique. (Arch. de phys. normale & path., 1885, p. 107.)

THE ACCESSORY SINUSES OF THE NOSE.*

WILFRED H. GARDNER, M. D.
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Doubtless, one of the least understood phases in the field of medicine, is a comprehensive understanding of the accessory sinuses by the general practitioner. There probably isn't any one field in medicine that is overlooked and neglected as the pathological conditions of the sinuses.

The nasal accessory sinuses in man are the residual olfactory organs. Owing to the small opening between these sinuses and the nose, inflammation of the mucous membrane of these cavities becomes a frequent pathological condition.

If the sinuses were more open to ventilation and drainage, inflammatory processes would occur less frequently. It follows, therefore, that when inflammation of the sinuses is present, the first principal treatment is to establish ventilation and drainage. This may mean that the swollen and inflamed mucous membrane around the sinus opening should be depleted by the application of adrenalin, cocaine, or antipyrine, or it may mean that some surgical procedure should be instituted for relief. Whichever is necessary, ventilation and drainage is the prime object. The removal of the morbid material is secondary.

The etiology of the inflammatory diseases of the nasal accessory sinuses, like that of other mucous lined cavities, is largely embraced in those conditions which interfere with the ventilation and drainage of the cavity. When there is good ventilation and drainage, inflammation is rare, except in those cases subjected to a very virulent infection, or in which the resistance is lowered by some dyscrasia, such as syphilis or tuberculosis.

When there is a granulomatous infiltration in the outer wall of the nose, the ulcerative process may invade the sinuses and give rise to symptoms of pain, tenderness, suppuration, headache and dizziness.

Diseases of the contiguous anatomical structure as the teeth, hard palate and outer wall of the nose may give rise to inflammation of the mucous membrane of the sinuses. Also caries of the root of the tooth, located beneath the floor of the maxillary sinus, may cause emphyema of the antrum by infection through the carious fistula thus formed, or by the way of the vessels and lymphatics. It has been estimated that nearly one-half of all the empyemas of the antrum have their origin in diseased teeth, while the remainder are due chiefly to intranasal diseases and antomical deformities of the nose.

Nasal dressings may cause a damming up of the secretions which undergo decomposition and infection and thus give rise to inflammation of the sinuses. Too much emphasis cannot be laid upon the untoward tamponing as it is a fruitful source of inflammatory diseases of the nasal and mucous membrances. Personally, I have abandoned intranasal dressings except in those cases where there is severe hemorrhage, or in which a dressing must be introduced to hold the septum in position after certain operations for the correction of deviations, and even then I do not leave them in one hour longer than is absolutely necessary to accomplish their purpose.

Venous stasis from intranasal pressure may cause sinusitis. The pressure may be due to some anatomical or pathological departure from the normal, as a deviation of the septum pressing against the outer wall of the nose, or a gummatous swelling of the septum.

The exciting causes of sinusitis are the various

*Read at meeting of McLean County Medical Society, Nov. 14, 1916.

microorganisms. It is well known that coryza is often one of the early phenomena in this class of cases, and that it is due to miscroorganisms and their toxins. The inflammation usually extends to the sinuses, where it may remain in a latent or chronic form. In some cases it is only after many years that the involvement of the sinuses becomes obvious enough to attract the attention of the patient or the physician.

The inflammation thus started is more apt to become chronic in those cases in which the cell openings are more or less blocked by anatomical deviations of the septum or other obstructive lesions of the nose.

Many authors of late have emphasized the causative relation of influenza to inflammation of the sinuses. In fact, they claim it is the most frequent cause of infection.

Symptoms: The intranasal are those changes in the appearance of the skin of the face and of the fundus of the eye as seen upon ophthalmoscopic examination. In addition to the objective signs, the results of transillumination and skiagraphing afford important information.

The intranasal objective signs are the changes in the appearance of the walls of the nasal chambers and the location of the secretion as it drains from the affected cells.

When any of the sinuses, contiguous to the skin of the face, are involved there may be redness, swelling and tenderness over the affected area.

Transillumination of the face affords objective information as to the maxillary sinus and sometimes of the frontal sinus, but none in reference to the other sinuses. In transillumination of the antrum, these points should be noted, namely, the red pupillary reflex, the crescent of light corresponding to the position of the lower lid and the sense of light in the eye when closed.

Transillumination of the frontal sinuses is an uncertain means of diagnosis, as the anterior wall often varies so much in thickness in the same individual. Taken as a whole, transillumination of the frontal sinuses is not a reliable procedure.

Skiagraphing of the accessory sinuses of the nose should be a routine practice, when access is had to a competent radiographer. A great difficulty is to find a radiographer who understands the technique well enough to produce clear plates.

The advantage received from skiagraphing of the sinus in diagnosis are: If a sinus is healthy its outline on the plate is clear and dark. If the sinus is diseased its outline is clear and distinct and its area is cloudy or hazy upon the plate. Prints from the plate are rarely satisfactory.

The dimensions of the frontal sinuses are clearly defined, thus affording the surgeon positive information as to the extent of exposure necessary before he begins an external operation.

A skiagraph through the lateral dimensions of the head, shows the depth of the frontal sinus, thus affording the surgeon additional data as to the deformity to be expected, should the Killian operation be performed. The wider and deeper the sinus, the greater the deformity following the complete removal of the anterior wall of the sinus. The information gained from the skiagraph as to the size of the sinus, will govern the operator as to what operation he will perform.

The Intranasal Objective Symptoms: The texture of the mucous membrane of the nose, especially that portion of it covering the middle turbinated body, is sometimes indicative of sinus disease. When the mucosa of the anterior end of the middle turbinate is boggy and velvety in texture, it usually signifies the existence of an inflammation of the ethmoidal cells. Polypi are often associated with diseases of the sinuses and usually secondary to the inflammation.

Pus within the nasal chambers, is usually significant of empyema of the sinuses. As the nasal mucosa is rarely the focal center of suppurative inflammation, the presence of pus in the nasal chambers should therefore excite suspicion of the existence of an inflammation of the sinuses, and especially after being wiped out, the pus soon accumulates.

The Subjective Symptoms: Pain, referable to the sinus involved, may or may not be present. In active inflammation of the antral or frontal sinus, pain is often referred to the region involved. In the deeper sinuses, as the ethmoidal and sphenoidal, the pain is vaguely deep-seated in the head or may be referred to the periphery of the head without reference to the location of the sinus.

Headache: Headache is one of the most common and significant sign of sinusitis, though it may be due to the middle turbinal pressing against the septum. This condition is often

taken for eye strain. Refraction is rarely satisfactory and when the anterior end of the middle turbinate is removed, is the headache relieved and glasses accepted. In many cases glasses are not necessary. Headaches have multitudinous causes and is not therefore pathognomonic. Headaches may signify eye strain, but in this case it is usually bilateral, whereas in sinus disease it is more often unilateral, and if not unilateral, it is more pronounced on one side than the other. The headache which begins in a sinus is usually made worse by stooping forward and upon sudden jar of the body. It may persist upon closing the eyes upon retiring or in a darkened room, whereas if it is of ocular origin it disappears under such conditions.

The headache of ocular origin is generally increased upon prolonged reading and attendance at the theatre. This type of pain is not characteristic of sinus disease.

The pains and headache due to disease of the frontal sinus, may assume the form of sharp, shooting pains through the eyes or they may be dull and heavy or may consist of a dull feeling in the forehead which is aggravated by leaning forward.

Tenderness and pain upon pressure may be present in diseases of the sinuses contiguous to the surface of the skin, namely, the frontal, anterior ethmoidal and maxillary. Giddiness and vertigo, or a momentary sense of blurred or darkened vision, or a sense of fainting are frequently present in diseases of the sinuses. All these symptoms may be aggravated or produced by stooping forward. A patient should be carefully questioned in regard to the symptoms, as otherwise they may be overlooked.

The olfactory sense may be perverted. The patient apparently perceiving odors that do not exist, or loss of olfaction. This is caused by blocking the olfactory fissure by swollen tissues in the region of the middle turbinate. The ventilation of the superior meatus of the nose is thereby prevented, hence the loss of the sense of smell.

The ocular function may be disturbed or altogether lost in the course of sinus disease. The morbid process in the eye may take the form of a papillitis, retinitis, retrobulbar disease and errors of refraction or accommodation.

The intimate relation between the veins of the nose and accessory sinuses of the eye, makes an extension of the disease of the sinuses to the ocular apparatus by the veins and lymphatics, very easy. Paralysis of the extra-ocular muscles is often due to inflammation of the sinuses, because the nerves which supply these muscles are in close anatomical relation to the sinus walls.

The principles of treatment depends upon three things: the establishing of free drainage and ventilation, the removal of the morbid material and elevation of the opsonic index. The appreciation of these fundamental principles enables the surgeon to decide upon the method of treatment in each case.

Acute catarrhal sinusitis is usually an extension of a similar inflammation of the nasal mucosa in the course of a coryza or cold in the head. The mucous membrane of the nose and sinuses is hyperemic and swollen. The ostia may be closed from swelling of the mucous membrane. The obvious indication is to relieve the swelling by application of certain drugs such as cocaine, adrenalin and antipyrine.

In some cases it is necessary to probe the sinuses and in some cases it will be necessary to straighten the septum or remove a portion of the middle turbinate.

Chronic suppurative sinusitis with obstructive lesions, necessitates their removal, whether they be of septal, turbinal or other origin. In this case there is simple obstruction and no morbid material except pus is present, hence the removal of the obstructive lesion permits of drainage, which removes the pus. The foregoing statement does not invariably hold good, because in most of the cells the opening is near the upper limit. The ciliated columnar epithelium which lines the cells, carries the secretions up to the cell openings, where it is discharged into the nasal cavity. If, therefore, the cilia are destroyed by the inflammatory process the removal of the obstructive lesions does not necessarily establish free drainage. In such cases it may be necessary to institute operative measures, in order to open the cells at the more dependent portion, or in case of the ethmoid to exenterate them in their entirety. Chronic suppurative sinusitis with granulation, polypi or necrosis is amenable only to surgical treatment.

Griesheim Building.

ILLINOIS MEDICAL JOURNAL

Published monthly by The Illinois State Medical Society, under the direction of the Publication Committee of the Council.

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JANUARY, 1917

Editorials

HEALTH INSURANCE BILL.

In the December number the ILLINOIS MEDICAL JOURNAL published the medical provisions of the so-called model Health Insurance bill, as it was at that time. A large number of our readers apparently overlooked it, although it was signed by the members of the Committee on Social Insurance of the Chicago Medical Society. The committee is receiving numerous calls from members for copies of the bill. For this reason and at the request of the chairman of the committee, we are again publishing the medical provisions of the tentative bill as it is at this date. We have not the full text of the bill, nor could we give it space, but the following sections are those which contain the medical provisions and which are of interest and importance to the profession. (See page 58.)

The tentative bill was developed in conference with physicians and submitted for criticism and discussion. Copies of this tentative bill can be obtained from the Committee on Social Insurance of the American Association for Labor Legislation, 131 East 23rd St., New York City.

BIRTH CONTROL.

Newspaper report has it that the Vice Censor of New York City has the New York Medical Society on record as to whether to brand birth control a vice or a virtue. The question was presented to the above Society at a recent meeting. The vote stood 72 for and 210 against birth control. Only two of the nine physician committeemen, who have been investigating the question for the last six months, reported favorably for a state law permitting doctors to advise married patients on birth control methods.

GIVING "COMMISSIONS" TO PHYSICIANS FOR PRESCRIPTIONS.

Some day an important question is going to be solved for pharmacy. How soon it will be solved depends entirely upon the temper of the pharmacist. There may be other, even more important, questions for pharmacists to solve; but for the purpose of this article, the dispensing doctor and the druggist who pays "commissions" on prescriptions constitute *the* important question. What are druggists going to do about it? The columns of the *Journal* are open for discussion.

The matter may be summed up in the following, which is practically a consensus of those druggists who are most largely affected by these evils, and is a sample of what arrives at the *Journal* office almost daily:

* * *

My own personal work in demonstrating the official preparations, with which I have had such pronounced good results in the past, has dwindled to almost naught, and only so because of the physicians' "buying" the druggists; for nearly every physician here *demands* a percentage or other favor if he "sends" any work. This proves positively to me that physicians are more interested in the money end of their game than in curative results, and the old chestnut about the "doctor's humanitarianism and philanthropy" is simply a cloak, a wolf in sheep's clothing.

I have the names of over fifty physicians on my books, every account is balanced, and *not one* is sending me any prescriptions now except *for themselves and their families*, and a few special formulas that they cannot get elsewhere. When they had to pay their accounts, like other white men, they used their influence and sent their prescriptions elsewhere. I do not believe there is a physician in our city who does not give me the credit of being a competent and careful pharmacist, and one who sends out the

best work in the city, but there is *not one* sending me any prescriptions, except as above noted, simply because I do not rebate them at all.

My business is good, better than ever before, and I have been here some time, but am not giving physicians any credit for it. Our medical men here, I note, are even discontinuing to specify "U. S. P." and "N. F.," but use proprietaries and oftentimes such as Stuart's dyspepsia tablets, Pinkham's compound, and castoria.

As the journal has often said, and repeats now: All the evils in pharmacy, irrespective of their kind, are costing pharmacy dear. It makes little difference whether individual pharmacists obtain a temporary gain, or whether various members of the medical profession profit thereby; the public is the loser from *any* and *all* evils that beset pharmacy, and when the public is the loser, pharmacy goes down hill. So great have the effects of these evils become that it is safe to say that already over thirty million persons have tabooed drugs entirely, and the ranks of the drugless cults are being swelled at a prodigious rate yearly. One may hide behind the cloak of competition all he pleases and in whatever form a druggist's fancy may dictate, the effect is always the same. There is *only one* remedy and that is for all pharmacists and all physicians to work together for the common good. To apply this remedy to bring about a cure, is *the question*, and it *must* be found, and very soon at that, or there will be no practice of pharmacy in the years to come.

The above from the N. A. R. D. Journal of December 21 needs little comment. Just why the editor of that journal would publish such a letter, and without signature at that, is beyond our comprehension. No one, not excepting the retail druggists, will believe a word of it.

The N. A. R. D. Journal is the official organ of the National Association of Retail Druggists, and one would naturally suppose it to be devoted to the interest of the retail druggists. This same journal has previously found fault with the doctor for dispensing, but we think just a little slander of this sort will do much to drive the doctor away from drug stores. If, when a doctor writes a prescription, he is going to be blackmailed with such charges by the druggists' official organ, the sooner he ceases writing prescriptions, the better.

NOTE: Definitions of terms used in the bill.
Commission—Means the Social Insurance Commission.
Fund—Means a Local or Trade Fund as the case may be.
Society—Means an Approved Society.
Carrier—Means the Society or Fund which carries the Insurance.
Disability—Means inability to pursue the usual gainful occupation.

MEDICAL PROVISIONS OF THE TENTATIVE DRAFT OF AN ACT FOR HEALTH INSURANCE.

Note: Definition of terms first column on this page.

Persons Insured.

The principle of compulsion has been adopted because authorities are pretty generally agreed that this is the only method to reach the poorest paid and the most improvident workers, who obviously most need the benefits offered by an insurance scheme. Thus in Great Britain, where voluntary sickness insurance had an exceptional development, only the better paid workers were insured, and it was found necessary in 1911 to enact a compulsory measure to give the whole population the necessary protection.

Employed persons only are included, except that medical attendance is to be given to the families. The wage-earner is usually the bread-winner of a family; his illness is normally an economic as well as a physical misfortune; his needs are therefore different from those of the classes not so directly dependent on health for their livelihood, or those of the non-wage-earning members of a family.

Section 3. *Compulsory Insurance.* Every employed person engaged in manual labor in the state and all other employed persons earning $100 a month or less, unless exempted under Section 4 of this act, shall be insured in a fund or society as provided in this act, except employes of the United States and except employes of the state or municipalities for whom provision in time of sickness is already made through legally authorized means which in the opinion of the commission are satisfactory.

Section 6. *Cases in Which Benefits Paid.* Benefits as provided in this act shall be paid or furnished in cases of sickness or accident, or of death or disability resulting therefrom, except cases in which any liability for compensation or other benefits is imposed by the workmen's compensation law.

Section 7. *Minimum Benefits.* Every fund or society must provide for its insured members as minimum benefits:

Medical, surgical, dental, and nursing attendance and treatment;
Medicines and medical and surgical supplies;
Sickness benefits;
Maternity benefit;
Funeral benefit;
Medical, surgical, and nursing attendance and medicines and medical and surgical supplies for dependent members of their families.

Section 8. *Beginning of Right.* The right to benefits, with the exception of maternity benefit, begins with the day of membership. The maternity benefit shall be payable to any woman insured against sickness for at least nine months during the twelve months preceding the confinement, to the wife of any man so insured, and, as respects confinement for a child of her husband, to the widow of any man insured for

at least nine months during the twelve months preceding his death.

Section 9. *Medical, Surgical and Nursing Attendance.* All necessary medical, surgical, and nursing attendance and treatment shall be furnished by the society or fund from the first day of sickness or the happening of the accident, provided notice has been given, otherwise from the date of such notice. In case of disability, it shall not be furnished for more than twenty-six weeks of disability in any consecutive twelve months. In case the society or fund is unable to furnish the whole or any part of the benefit provided for in this section, it must pay the cost of such service actually rendered by competent persons at a rate approved by the commission.

Section 10. *Medical and Surgical Service.* The fund or society, subject to the approval of the commission, shall make arrangements for medical and surgical attendance and treatment by means of either:

1. A panel of physicians to which all legally qualified physicians and surgeons and incorporated institutions and associations of such physicians and surgeons shall have the right to belong, and from among whom the patients shall have free choice, subject to the right of the physician or surgeon to refuse patients on grounds specified in regulations made under this act; but no physician on the panel shall have on his list of insured patients more than 500 insured persons with the dependent members of their families, except that for every person with no dependents he may have one additional such person;

2. Legally qualified physicians on salary and in the employ of the fund or society, among which physicians are insured persons and dependent members of their families shall have reasonable free choice;

3. Legally qualified physicians on salary and in the employ of the fund or society engaged for the treatment of insured persons and dependent members of their families in prescribed areas;

4. Combination of above methods.

Section 10-a. *Nursing Service.* The fund or society, subject to the approval of the commission, shall make arrangements for nursing attendance and treatment with nurses or incorporated institutions or associations of nurses.

Section 10-b. *Laboratory Facilities and Specialists.* The fund or society shall provide proper laboratory and other facilities for diagnosis and treatment and shall make arrangements with specialists, including dentists, for consultations, treatments and operations.

Section 10-c. *Local Medical Committee.* There shall be in each district in which there is a panel, a local medical committee of not less than seven or more than fifteen members. The commissioner of health in each city in which there is a commissioner of health, or local health officer elsewhere, shall appoint a member of his staff, who shall be a physician, as a member of the local medical committee of each district within his jurisdiction. The other members shall be legally qualified physicians and surgeons and shall be elected for terms of three years, part by the physicians on the panel of the funds in the district, part by the staffs of attending physicians and surgeons of the hospitals which have made agreements with a fund in the district to treat its insured members. The commission, subject to the approval of the medical advisory board, shall determine the proportion of members of the local medical committee to be elected by the panel physicians and by the attending physicians and surgeons of said hospitals. The committee shall elect its own officers and shall serve without compensation.

Section 10-d. *Meetings of the Committee.* The committee shall meet at least once every month and may be called together at any time on three days' notice by the chairman or by a call signed by five members. A majority of the members of the committee shall constitute a quorum.

Section 10-e. *Powers and Duties of the Committee.* All regulations affecting medical, surgical, or nursing attendance and treatment made by the board of directors of a fund or society shall be submitted to the local medical committee of its district, and shall not take effect until after the next regular meeting of the committee, unless sooner acted upon by the committee, except that the board may issue temporary regulations for the period of three months. Any dispute in regard to such attendance or treatment or any charge made against a physician because of his work for a fund or society shall be referred to the local medical committee of the district before action is taken by the board of directors. If the committee and the board of directors cannot agree, the matter shall be referred to the arbitration committee.

Section 11. *Medical Officers.* Each fund or society shall employ at least one medical officer, who shall be a legally qualified physician and possess such other qualifications as the state medical advisory board may prescribe. The appointment of a medical officer shall be subject to the approval of the local medical committee, but in case of failure or refusal to approve an appeal may be taken to the state medical advisory board, whose decision shall be final. No medical officer shall practice in any capacity under this act.

Section 11-a. *Certificate of Disability.* A certificate of disability shall be issued only by a medical officer, and only after his personal examination of the patient and upon the recommendation of the attending physician. Sickness benefits shall be paid only upon a certificate of disability. A medical officer may visit at any time persons recommended for or receiving sickness benefits.

Section 12. *Medical and Surgical Supplies.* Insured persons and the dependent members of their families shall be suplied with all necessary medicines, medical and surgical supplies, dressings, eye-glasses, trusses, crutches, and similar appliances, prescribed by the physician, surgeon, or dentist, the aggregate not to exceed $50 in cost for any insured person and the dependent members of his family in any one year.

Section 13. *Hospital Treatment.* Hospital or sanatorium treatment and maintenance shall be furnished, upon the approval of the medical officer of the fund or society, instead of all other benefits (except as provided in Sections 16, 19 and 20), with the consent of the insured member, or that of his family when it is not practicable to obtain his consent. The fund or society may demand that such treatment and maintenance be accepted when required by the contagious nature of the disease, or when in the opinion of its medical officer such treatment is imperative for the proper treatment of the disease or for the proper control of the patient. Sickness benefit may be discontinued (except as provided in Section 19) during refusal to submit to hospital or sanatorium treatment. Such treatment shall be furnished during the period for which sickness benefit is payable, and shall be provided in a hospital or sanatorium with which the fund or society has made satisfactory financial arrangements approved by the commission, or in one erected and maintained by the funds and societies with the approval of the commission.

Section 14. *Arbitration Committee.* Any dispute between an insured person and a physician or between funds or societies and physicians shall be referred to an arbitration committee, composed of one member appointed by the local medical committee, one member appointed by the board of dierctors of the fund, and a third member, who shall be chairman, appointed by a judge of the county court or by a justice of the supreme court in counties in which there is no county court. The decision of the arbitration committee shall be final unless an appeal is taken to the commission within ten days from the date on which the decision is rendered.

Section 15. *Sickness Benefit to Insured.* A sickness benefit, equal to two-thirds (66⅔ per cent.) of the weekly earnings of the insured member, shall be paid beginning with the fourth day of disability on account of illness or accident. It shall be paid only during continuance of disability, and shall not be paid to the same person for a period of over twenty-six weeks in any consecutive twelve months, nor for more than twenty-six weeks on account of the same case of disability. This benefit shall be paid to an insured woman when disabled on account of pregnancy, except that it shall not be paid to her during the period when she is receiving cash maternity benefit. The weeks during which sickness benefit is discontinued because of refusal to accept hospital treatment shall be included in computing the period of twenty-six weeks.

Section 16. *Sickness Benefit to Dependents.* A sickness benefit equal to one-half (50 per cent.) of the earnings of the insured member shall be paid to his family, if any, or to other dependents, if any, while he is in the hospital or sanatorium or while he refuses to submit to such treatment.

Section 18. *Maternity Benefit.* Maternity benefit shall consist of:

All necessary medical, surgical and obstetrical aid, materials and appliances, which shall be given insured women and the wives of insured men;

A weekly maternity benefit, which shall be payable to insured women only, equal to the regular sickness benefit of the insured, for a period of eight weeks, of which at least six shall be subsequent to delivery, on condition that the beneficiary abstain from gainful employment during period of payment. Benefits under this section shall be in addition to all other benefits under this act.

Section 43. *State Social Insurance Commission.* A state social insurance commission is hereby created, consisting of three commissioners, to be appointed by the governor, one of whom shall be designated by the governor as chairman, and one of whom shall be a physician. The term of office of members of the commission shall be six years, except that the first members thereof shall be appointed for such terms that the term of one member shall expire on January first, nineteen hundred and nineteen; one on January first, nineteen hundred and twenty-one, and one on January first, nineteen hundred and twenty-three. Each commissioner shall devote his entire time to the duties of his office, and shall not hold any position of trust or profit, or engage in any occupation or business interfering or inconsistent with his duties as such commissioner, or serve on or under any committee of a political party. The commission shall have an official seal which shall be judicially noticed.

Section 56. *Medical Advisory Board.* There shall be a medical advisory board of eleven members. The state commissioner of health shall be ex-officio a member of the board, six members shall be chosen by the Medical Society of the state, two by the Homeopathic Medical Society of the state, and two by the Eclectic Medical Society of the state. The term of office of chosen members shall be three years, except that the members first chosen shall choose by lot three of their number to go out of office at the end of one year and three at the end of two years. The board shall elect its own chairman and other officers. Its members shall be paid necessary expenses, but no salaries.

Section 57. *Powers of Board.* All regulations of the commission relating to the medical benefit and to the relations of physicians or surgeons to the insurance shall be referred to the board and shall not be approved by the commission until after the first regular meeting of the board after such reference, unless sooner acted upon by the board, except in case of an emergency, when the commission may issue a temporary regulation for a period of not over six months.

Section 58. *Meetings of the Board.* The board shall meet at least once every three months and may be called together at any time on one week's nottice by the chairman or by a call signed by any five members or by the commission. A majority of the members of the board shall constitute a quorum.

Section 59. *Medical Disputes.* All disputes regarding medical benefit, which have been appealed to the commission, shall be referred by the commission to the medical advisory board, which shall report to the commission and the commission shall not decide any such dispute until after a report has been made by the board.

MEDICAL PROVISIONS APPROVED.

Several prominent medical societies have approved the proposals for universal workmen's health insurance and will co-operate in putting them into legislative effect.

After concentrating attention upon the medical provisions, the Council of the Medical Society of the State of New York, "considering that these essentials safeguard the public interest, the public health, and the welfare of the medical profession," by resolution approved and endorsed them and instructed its committee on medical economics in conjunction with its committee on legislation to act accordingly."

These provisions are receiving the careful consideration of physicians throughout the country. Approval by many medical societies is expected in the near future, and the co-operation of each is desired.

HEALTH OF THE NAVY.

We have recently received the annual report of the Secretary of the Navy for the fiscal year. The report is interesting reading, and it is gratifying to read of the general improvement of things pertaining to the Navy.

The portion of the report which interested us most is, "Health and Sanitation." It is evident that the general health of our naval men is being better looked after. During the year, 4.48 per 1,000 of the naval personnel were lost by death. This looks pretty good, although it is to be remembered that our Navy did no fighting during the year. Of the total number of deaths in the Navy, 51, or one-sixth, were due to drowning, and this included 21 who went down with the F-4.

The three predominant causes of death in the Navy are drowning, pneumonia, and strange to say, tuberculosis. These three causes of death all show upon analysis improvement over preceding years.

It is difficult for us to understand why 11 per cent. of all deaths in the Navy were due to tuberculosis, and this in a year that showed a lessened death rate from tuberculosis. Applicants for the Navy are picked men. During last year only 30.18 per cent., not quite one-third, of all applicants were accepted as fit for the service. These men were selected by very competent medical examiners, and a rather rigid examination is made. Considering the fresh air opportunities of the sailor and his lessened proximity to tuberculosis infections, taken with his physical fitness and freedom from disease on joining the Navy, this seems an unexpected death rate from tuberculosis.

In this connection it is well to note that the Surgeon General states "that no Navy in the world is as well fed, as well clothed, its general welfare so thoroughly looked out for as that of the United States." This statement is confirmed by Mr. Hector O. Bywater, a naval authority, when comparing the personal care of the American bluejacket with the best European naval standards.

PAY THE PHYSICIAN

It was never the intention of the workman's compensation act to force free service from the physicians who attend clinics. Yet that is exactly what is being done in many cases. The *Medical Economist* calls public attention to the fact, which is a matter of common knowledge among surgeons and their friends. This is part of the statement printed by *The Economist:*

So far as the writer can find out the present practice of the medical corporations of New York City with regard to the moneys received for compensation cases varies greatly. A few institutions do what is right and give the fees to the doctors who do the work. A few others give the physicians half or a smaller part of the fee. But most of them disobey the intent if not the letter of the law.

Certainly the surgeons who give their skill and labor in clinics make a sufficient contribution through the great number of wholly philanthropic cases. There is no reason why they should be deprived of the money set apart by employers to meet the cost of attendance on injuries incurred by their workmen.

"These people come to the free clinics in great numbers," declared a busy New York surgeon. "We treat them, but we cannot take any pay for what we do in such institutions. We are more or less hardened to seeing the privileges abused, in one way or another. I asked one very well dressed man who came for free treatment how much he earned and he answered 'Seven dollars a day.'"

Doubtless there are features of medical and surgical practice which need reform from within. Standards need to be raised in some quarters. But if we are to employ physicians at all nothing can excuse such injustice to them.—*New York Evening Sun.*

PHYSICIANS EXCLUDED FROM NEW HOSPITAL.

Chicago is, in the near future, going to open a magnificent new municipal hospital for the isolation and care of patients sick from contagious diseases. We have been informed that the general profession will be excluded from this institution. Just why this is so has not been explained, but we predict that those officers responsible for such a ruling, if it is made, will have some difficulty in explaining why to both the laity and the profession, and that they will close the tenure of their offices with the odium they will so justly deserve.

In the old contagious disease hospital a physician might treat his diphtheria patient. In the Municipal Tuberculosis Sanitarium the law gives the physician the right of treating his tuberculous patient, if the patient so desires, and there can be no valid reason why the family physician may not treat his patient in a contagious disease hospital.

The Health Department has constantly talked quarantine, has where possible enforced quarantine, and has time and again asked the profession to co-operate with the department for better quarantine methods. The profession has seen the need of isolation provisions, and has devoted its energy to having a municipal contagious disease hospital erected. Once the hospital is erected the department with its super wisdom foresees the family doctor is incapable of caring for those infectious diseases in the municipal hospital—at home he has not been found incompetent by the family.

If isolation of the sick is the best method of preventing the spread of contagious disease, why should not isolation be encouraged, and why should the family physician be deprived of caring for his patient, or why should the patient be deprived of the physician of his choice? If the department wishes the support of the profession in eliminating contagious disease and in isolating those who have contagious disease, why does it not give the profession credit for at least mediocre ability, and treat it with a deserving courtesy?

The cry put up by the authorities, of course, will be that it would cause confusion and lack of discipline in the hospital if an outside physician were admitted to its portals. General hospitals of any size are open to the profession, and this has proven both feasible and successful. We venture to say that a contagious disease hospital, open to the profession, will not have such scandal attached to it as has attached to certain charitable institutions in the past, nor will it have such spread of infection as now occurs in some of our public institutions.

The light of publicity may be a good thing for the patients confined in an isolation hospital. The private physician is a servant of the public, and as such is entitled to the educational advantages which can be obtained in any of the municipal institutions. The public has the right to demand that the physician keep abreast of the times with his medical education, and should afford him the opportunity for educational advancement through the municipal hospitals. Hospital methods which may thus be given the general physician go far in promoting efficiency in the profession.

We hope those in authority will review their decision, open their eyes and see what is the better plan of operation, and give the profession the opportunity to isolate and care for those contagious patients in a manner acceptable to the people who built the institution and to the profession that is always looking after the best method of serving humanity.

MEDICAL LEGISLATION.

This year bids fair to be an important one in medical legislative matters. Enforced health insurance is attracting the attention of doctors in all the states. It is certain that health insurance bills will be presented to the assembly in Illinois. Just what form these bills will take is as yet unknown to us; but it behooves the profession to be on guard, and to work for an insurance bill which will be acceptable to the physician.

In years past it has been difficult for the legislative committee to get physicians to act, or to act in time to be of real assistance. This year every physician in Illinois should be ready to do at once what the social insurance and the legislative committees request him to do. It takes but a few minutes to write or telephone your congressman.

The obnoxious optometry bill passed the last legislature largely because it was impossible to get doctors to advise with their legislators, or to do so at the right time. When a bill has been enacted, it is too late to go to your congressman and ask him to defeat it.

If every member of the Society will keep him-

self posted on these various social insurance bills, and will keep in touch with his congressman, there will be less difficulty in keeping out of the statutes of Illinois laws objectionable and unfair to the profession. Doctor, you should now get in touch with the times.

NOTICE

Beginning with the January, 1917, issue, the *Louisville Monthly Journal of Medicine and Surgery* will become the official organ of the MISSISSIPPI VALLEY MEDICAL ASSOCIATION, appearing with that issue in new dress and under the name of the *Mississippi Valley Medical Journal*. The proceedings of this Association have been for years of the highest scientific nature, and the appearance in full of papers and discussions in convenient form for binding will enable members and subscribers to preserve these valuable proceedings.

Dr. Henry Enos Tuley, Secretary of the Association, will continue as Editor; Dr. H. H. Grant as Business Editor, and a special Editorial Committee, composed of the following, will assist in the editorial policy of the Journal: Drs. William N. Wishard, Indianapolis; Arthur R. Elliott, Chicago; Willard J. Stone, Toledo, Ohio, and Louis Frank, Louisville.

Public Health

ANNUAL SUMMARY OF STATE HEALTH WORK.

In the annual summary of state departmental work which is collected at the end of each year for official purposes, the following accomplishments are credited to the Illinois State Board of Health. While largely devoted to 1916, the data collected this year includes certain activities for the past two years being arranged in this way for the information of the General Assembly which meets biennially.

1. The enactment of a large number of salutary health laws by the Forty-Ninth General Assembly; more sound health laws than had been passed by any previous legislature. Many of the more important of these measures had been recommended to the Governor in the annual report of the State Board of Health for 1914 and published in the *Illinois Health News* for January, 1915.

2. The establishment, for the first time, of an efficient system of registration of births and deaths through which Illinois will doubtless be accepted by the United States Bureau of the Census as a registration state and will be relieved of the odium of its former lack of such recognition.

3. The division of the state into sanitary districts, each of which is under the supervision of a full time medical health officer appointed through Civil Service. Five districts have already been created.

4. The creation of the office of state epidemiologist, an expert who is charged with the diagnosis in doubtful cases of communicable diseases and with the suppression of epidemics of such diseases.

5. The creation of a Sanitary Engineering Bureau under the direction of competent sanitary engineers and equipped with laboratory facilities and especially charged with the supervision of water supplies, sewage disposal, inspection of school buildings and the property of common carriers, the conduct of sanitary surveys, etc. Until this time, Illinois has never had such a department, essential as it is to adequate public health supervision.

6. The extension of the work of the Central Diagnostic Laboratory at Springfield and the establishment of four branch laboratories for the convenience of physicians and health officers in the north, south, east and west sections of the state. There has also been created a portable field laboratory to be employed in epidemics where laboratory facilities are not otherwise available.

7. Extension of the service of the board in supplying, without cost, preventive and curative vaccines, sera and other agents. The board now supplies, through its five hundred agents scattered through the state, diphtheria antitoxin, typhoid vaccine, smallpox vaccine, nitrate of silver solution for use in the eyes of the new-born and the Schick test to determine immunity to diphtheria. Smallpox vaccine also is supplied for free vaccinations.

8. Standardization of the rules and regulations for the control of all communicable diseases and the uniform application of such rules, for the first time, in all sections of the state.

9. Establishment of a Bureau of Dairy Inspection devoting itself chiefly to the supervision of dairies situated outside the jurisdiction of incorporated cities and villages and, hence, up to this time, under no governmental control.

10. Development of a comprehensive system of popular health education, including the publication of entirely new pamphlets on the care of infants, tuberculosis, infantile paralysis, the care of infants and similar subjects; the publica-

tion of a popular monthly health journal; noteworthy traveling health exhibits; a loan collection of motion pictures, stereopticon slides, etc., a regular weekly press service for newspapers, etc.

11. The advancement of standards in the Examination and Licensure of Physicians and Other Practitioners along rational lines until, at the present time, the medical educational standards of Illinois compare favorably with those of any other state in the Union.

In addition to the cordial relationship maintained with local health officers and physicians, the work of the State Board of Health has been rendered more effective by a close co-operative relationship with the various extra-governmental agencies interested in special lines of public health endeavor.

Among the important measures recommended by the State Board of Health for legislation by the Fiftieth General Assembly, which will convene immediately after the first of the New Year, are the following:

1. The creation of a Division of Tuberculosis. This is rendered necessary by the ever increasing interest in the prevention and suppression of tuberculosis and imperative by the creation of county tuberculosis sanatoria, dispensaries and nursing services throughout the state. Eight such organizations were adopted at the last general election and it is not unlikely that a score or more will be created at the next general election. The State Board of Health is charged, under the provisions of the county sanitarium law, with approval of plans for all county tuberculosis institutions. In addition to this, it must be recalled that, up to this time, Illinois has done less than any of the major states in the warfare against this disease.

2. The creation of a division of Child Hygiene and Public Health Nursing.

3. The creation of a division of Industrial Hygiene.

4. Extension of the service of Dairy Inspection with increased powers to act.

5. Provisions for doubling the number of sanitary districts of the state with full time medical health officer in charge of each district.

6. Separation of the public health functions of the State Board of Health from those having to do with the examination and licensure of physicians and enforcement of the Medical Practice Act.

7. An amendment to the Medical Practice Act providing reciprocity in medical licensure for those licensed prior to July 1, 1909.

8. An amendment to the Medical Practice Act providing for the revocation of licenses of physicians and other practitioners addicted to the use of narcotic drugs or found guilty of major crimes, and of those adjudged mentally unsound.

9. The expansion of the functions of the Sanitary Engineering Bureau to provide for an organized service for municipal and rural sanitary surveys, sanitary inspection of schools, hotels and public buildings.

EXCLUSION OF UNVACCINATED CHILDREN FROM SCHOOLS UPHELD. INJUNCTION DENIED.

A number of cases of smallpox having developed in December in the city of Rockford, the Board of Education directed the exclusion from the public schools of all unvaccinated children, as required by an ordinance of the municipality.

An application for an injunction restraining the school board and the city authorities from enforcing such ordinance was referred to Master in Chancery E. H. Marsh, by whom the injunction was denied. In his decision Mr. Marsh held that the defendants are public officials, vested with discretionary power and that no fraud, corruption, oppression or gross injustice having been shown and that there being no showing that the necessity which gave rise to the action had ceased to exist, the injunction should not be granted.

A SERVICE GUIDE OF THE STATE BOARD OF HEALTH

The October number of *Illinois Health News*, the official bulletin of the State Board of Health, appears in the form of a service guide of the various activities of the Board, giving to health officers, physicians and laymen complete information as to what service the "medical department of the State government" is prepared to render and just how this service is obtained. In the preface to this service guide it is said: "The State Board of Health will prove just as valuable to the various cities, towns and communities of Illinois as these communities choose to make it. The State maintains a relatively complete machinery for meeting the sanitary and health needs of the people. * * * Realizing that the State health machinery, however

perfect, is of little value unless known and utilized by the people, these facts on how to obtain the service of the State Board of Health are set forth."

The service of the Board, under the existing organization, is divided into: 1.—Educational Service; 2.—Technical Advice; 3.—Laboratory Service; 4.—Distribution of Preventive and Curative Sera and Vaccines; 5.—Bureau of Sanitary Engineering; 6.—Bureau of Vital Statistics; 7.—Dairy Inspection; 8.—Lodging House Inspection, and 9.—Examination and Licensure. The educational service, available without cost to the people of Illinois, consists of the distribution of sixteen new circulars on the various preventable diseases, infant welfare, disinfection, etc.; the monthly Health News, a popular health journal; large, mechanical health exhibits; small, portable exhibits; a loan collection of motion picture films and stereopticon slides; a lecture service on public health subjects together with a loan collection of health lectures ready to be used by local lecturers and a weekly press service reaching all of the newspapers in the State. A new feature is a public health loan library through which health officers are supplied with text-books and treatises on health subjects.

The technical advice service consists of special investigations by the Bureau of Sanitary Engineering, the State health officers, the State epidemiologist, dairy inspectors and other representatives of the Board; the special investigation of all cases of poliomyelitis and the advice of municipalities in local sanitary problems and in the drafting of health ordinances and codes.

The laboratory service, which is being used more and more by the physicians of the State, includes free examinations for the diagnosis of tuberculosis, malaria, diphtheria, typhoid fever and syphilis. Wasserman tests are made free only for indigent persons. Examinations are made of presumedly rabid animals and treatment is given without cost to those bitten by such animals. The laboratories consist of a central laboratory at Springfield, with branches for the diagnosis of diphtheria at Chicago, Mount Vernon, Urbana and Galesburg and a traveling laboratory employed by the State epidemiologist in the field in times of epidemic or emergency. A laboratory for the examination of water supplies, sewage, etc., is being established in connection with the Bureau of Sanitary Engineering.

The preventive and curative agents furnished free by the State Board of Health, through its agencies, at least one of which is to be found in each county, are: diphtheria antitoxin, typhoid vaccine, smallpox vaccine and packages of nitrate of silver solution for use in the eyes of infants at birth. The Schick test, to determine the immunity of the individual to diphtheria, can be obtained only through the office of the Board at Springfield. The service guide, incidentally, contains a complete list of the State Board of Health agencies in Illinois.

The Sanitary Engineering Bureau investigates municipal and private water supplies and sewage disposal; passes upon and recommends municipal sanitary installations and improvements; makes sanitary surveys of municipalities; inspects schools; investigates the sanitary conditions of stations, work camps and rights of way of railways; investigates sanitary conditions of summer resorts and outlines plans for mosquito extermination.

This brief summary, covering but five of the nine departments of activity, indicates the broad variety of useful service which the physicians and people of Illinois may obtain through the State Board of Health entirely without cost. In looking over the list it seems that there is hardly any form of local health activity in which the Board is not ready to cooperate, giving facilities for efficiency otherwise unobtainable. The service guide should serve as a key to open up to the people the facilities of the Board, many of which have been relatively unknown throughout the State in spite of the general policy of publicity about them.

A SERIES OF HEALTH CIRCULARS FOR SCHOOL CHILDREN

Recognizing the difficulty in reaching certain classes of adults with health education and appreciating the readiness with which school children of the present day master health subjects even of a rather technical character, the State Board of Health has begun the publication of a complete series of health circulars for school children. The first of these was issued early in the month under the caption: "How to Avoid Disease." The other circulars will follow in quick succession.

"How to Avoid Disease" is rather general in character, teaching the theory of the "seed and the soil" in the transmission of communicable diseases. The analogy of the seeds of plants and flowers to the germs of disease and the soil to the human body is carried out in a manner which is strikingly simple and entertaining. With all of the simplicity and attractive style, the text remains strikingly true to the tenets of scientific medicine.

It is said that this is the first series of the kind ever published in the United States and that it has met a definite need is indicated from the fact that, upon its first announcement and before the circular was off the press, a request for a thousand copies had been received, these to be used as the basis of essays in Illinois schools.

Take heed of jesting—many have been ruined by it. It's hard to jest and not sometimes jeer, too, which oftentimes sinks deeper than was intended or expected.

If the wicked flourish and thou suffer be not discouraged. They are fatted for destruction. Thou art dieted for health.

Disease is the nation's greatest burden?

TUBERCULOSIS NOTES.

An X-ray of the child with "tuberculous infection" will probably show tuberculous disease of the bronchial lymph glands, especially where possibility of infection exists.

The successful treatment of pulmonary tuberculosis makes it imperative that an early diagnosis be made.

The most frequent methods of onset of pulmonary tuberculosis are a neurasthenia, a pleurisy, a fever, an anæmia, a pneumonia, a persisting laryngitis and a pulmonary hemorrhage. Remembering these methods of onset will often aid in the early diagnosis so essential to recovery.

The general symptoms of a case will often make a diagnosis where no definite physical signs can be found with the stethoscope.

Dinan in his investigation of blood-pressure before, during and after pulmonary hemorrhages has found (1) that hemorrhage from tuberculous lungs is never due to high blood-pressure, but (2) that the bleeding consumptives have lower blood pressure than the average consumptive, and (3) that blood pressure for the hemorrhage case, just before the hemorrhage, is lower than the normal of that case, that (4) the blood pressure rises during the hemorrhage, and (5) that the blood pressure remains high for a short time after the hemorrhage and then slowly falls to what it was before the hemorrhage.—Maher, *Medical Record*, Aug. 5, 1916.

Dilatation of the veins of the chest and forehead in children should bring to mind bronchial gland tuberculosis.

Cases of tubercular meningitis in children that have come to autopsy show almost invariable tuberculosis of the bronchial lymph glands.

In 1,200 cases of diseases of the air passages in soldiers, 560, or practically 50 per cent., were cases of pulmonary tuberculosis.—Hochhaus, *Deut. Med. Woch.*, Sept. 11.

A persistent cystitis, with frequent urination day and night, and especially if accompanied by hœmaturia, should bring to mind renal tuberculosis.

Society Proceedings

ADAMS COUNTY.

Members of the Adams County Medical Society, who were unable to attend the November meeting at the Hotel Newcomb missed one of the best sessions the society has had in months. The feature was an illustrated lecture by Dr. C. St. Clair Drake of Springfield, secretary of the Illinois State Board of Health. His subject was, "Why a State Board of Health?" He told why a state needs such an organization by reviewing the activities of the board since it was first created, explaining what has been done, what the board is doing now, and what it is to do in the future, including medical legislation and general sanitary laws. Dr. Drake spent some time discussing the birth and death registration act, adopted at the last session of the legislature, at the same time showing a film entitled "Tommy's Birth Certificate." He talked of better babies and told what the board has done and is doing in the better-baby campaign. In connection with this subject he showed a film entitled "Summer Babies," illustrating the work of the Infant Welfare Society of Chicago. Communicable diseases and methods of prevention were also most interestingly shown.

Dr. Drake told of the work of the bureau of communicable diseases. This bureau consists of state epidemiologists with four district health officers, each officer having a district in which he keeps posted on the general condition of health and sanitation, number of contagious diseases, methods employed to prevent spreading and with what success, and other information which helps in the campaign for better health. The fourth reel was "The Man Who Learned." It was a pure milk film, illustrating the need for cleaner dairies and cleaner milk for better babies. The talk was very timely, following as it did the lecture by Dr. East of Galesburg, one of the most efficient health officers in Illinois. Dr. East lectured before the Medical Society at its meeting in October.

At the business session of the society, Dr. Frank R. Morgan was voted a member, and the application of Dr. W. A. Trader was read. It was voted to return to the original plan of having day meetings during the Winter. The sessions have been held after supper for nearly a year. Members living in the country find it is not easy to attend night sessions in the Winter, and for their convenience it was decided to have day sessions for a period of six months. Twenty-seven members were present, including Drs. J. L. Aleshire of Plainville, G. E. Whitlock of Columbus and W. E. Mercer of Liberty.

ELIZABETH B. BALL, Secretary.

Regular Meeting, December 11, 1916

The Adams County Medical Society held its meeting at the Hotel Quincy, Monday, December 11. The attendance was large and the meeting proved a very good one. The election of officers resulted as follows: President, J. L. Aleshire of Plainville; vice-president, Dr. Walter Stevenson of Quincy; second vice-president, Dr. C. E. Ericson of Quincy; secretary, Dr. Elizabeth B. Ball, Quincy; treasurer, Dr. J. H. Blomer, Quincy; censors, Dr. D. M. Knapp of Mendon, Dr. Kirk, Shawgo, and Dr. Warren Pearce, Quincy; defense committee, Dr. John A. Koch, Quincy; delegate, Dr. H. P. Beirne; alternate, Dr. R. J. Christie, both of Quincy.

A resolution was passed instructing the secretary to extend the sympathy of the society to Mrs. J. H. Rice, because of the illness of her husband, and to send flowers. Dr. R. J. Christie introduced a resolution that the society give its hearty support and cooperation to the city council and all organizations interested in the health survey to be made here. Dr.

C. D. Center offered an amendment that the members not only give their hearty co-operation but aid the officials making the survey in every way possible. Both the resolution and the amendment carried.

Dr. L. H. A. Nickerson offered a resolution that the society endorse the action of the city council in passing the milk ordinance and refusing to strike out two important features of the same, namely, the tuberculin test and the temperature of the milk for delivery, the required temperature being 55 degrees.

The January meeting will be held January 8 at the Hotel Quincy, and will be in the evening instead of in the forenoon. On this occasion a banquet will be given in honor of the retiring officers.

ELIZABETH B. BALL.

COOK COUNTY.

CHICAGO MEDICAL SOCIETY

Regular Meeting December 6, 1916.

The Bone Diseases Frequently Seen by the Practitioner; Pathology and Diagnosis; Lantern Slides and specimens. Richard R. Smith, Grand Rapids, Mich. Discussion by D. W. Graham, Lawrence Ryan, Harry Mock, A. G. Zimmerman and Paul Magnuson.

Regular Meeting December 13, 1916.

The Late Operative Results in Exophthalmic Goiter. Vernon C. David. Discussion by J. J. Moorehead.

Hunger and Appetite in Disease. A. J. Carlson, University of Chicago. Discussion by Bertram W. Sippy and J. C. Friedman.

The Diagnosis and Management of Urethral Calculus; Lantern Slide Demonstration. Lewis Wine Bremerman. Discussion by Filip Kreissl and Charles M. McKenna.

Regular Meeting, December 20, 1916.

Seminal Vesiculectomy, Illustrated with Lantern Slides. John H. Cunningham, Boston, Mass., well-known author on genito-urinary subjects. Surgeon to the Boston City Hospital and widely known professionally. Discussion by W. T. Belfield, L. E. Schmidt, G. Kolischer, D. N. Eisendrath and H. L. Kretschmer.

CHICAGO MEDICAL SOCIETY.

A regular meeting was held Nov. 22, 1916, with the president, Dr. A. A. O'Neil, in the chair.

EXPERIENCES IN BONE SURGERY OF THE PRESENT WAR IN FRANCE.

Dr. Fred H. Albee of New York City related his three months' experience in the war zone, saying that he had had the opportunity of going over France pretty thoroughly, visiting the trenches, and was at the front. A large percentage of the plastic surgery of this war is devoted to bone, joint, nerve and tendon surgery. There is not so much soft tissue surgery on account of infection and laceration of parts, etc. The longer the war lasts the more plastic surgery there would be of all types. Plaster of paris is not as desirable an agent for the controlling of fractures as one might think. Personally, he had been accustomed to using plaster of paris a great deal and expected to find it used considerably in Dr. Blake's Hospital, but he found that it was not used very much, as in the case of large lacerated wounds it could not be applied very well. Traction frames are used, putting the limbs up in the position of neutral muscle pull with the various angles that the adjustable frame will allow.

As to the specialization in surgery, there were hospitals devoted to the perfection of artificial limbs, the adjustment of the artificial limb, and the preparation of the stump for the artificial limb. It is wonderful what has been accomplished in this respect. The author presented moving pictures of the Dakin-Carrel method of sterilization of wounds, and spoke of the advantages and what had been accomplished by this method. This is one of the big things that has come out of the war from a surgical standpoint.

DISCUSSION

Dr. Kellogg Speed said that in the English army they do not use very much plaster of Paris, so far as his knowledge went, but they depended very largely for a permanent dressing and for transportation of the wounded on various wire, metal and wood splints, of which the Thomas splint is a shining example. This has been adapted to cover almost any type of injury and is used extensively for shipping the wounded men across the English channel. No soldiers are sent from English base hospitals across the channel to England until they are in proper condition for such transportation. If a soldier is septic or it is impossible to move him on account of a fracture, he is held, regardless of rush or any other condition, until it is absolutely safe to put him on board a boat. He did not know of one case that passed his hospital in which a man suffered a secondary hemorrhage or a fatal termination during the course of transportation.

They obtained the same results with a little different method perhaps than that which Dr. Albee had shown. Instead of using drainage tubes, they frequently used simply a rubber fenestrated drainage tube, and instead of having elaborate apparatus for irrigation, the nurses are required to go around every two hours and instill the solution with a small hand syringe. The results were excellent. In addition to Dakin's solution he had used hypertonic salt, particularly for wet dressings, and he believed surgeons will come to adopt that in this country for diffusely suppurating surfaces, inasmuch as it causes the outpouring of lymph, which overcomes infection.

Dr. H. M. Richter stated that in the hospital in which he worked in Germany there was a great number of infected wounds—in fact, it was rare to see a clean wound. Ninety-five per cent were shell wounds, but with the battle on the Somme they began to get more rifle wounds. Previous to that time, however, more than 95 per cent were shell wounds. These wounds were ugly, were badly lacerated and all infected. They had approximately 1,500 beds distributed among fourteen buildings. Three buildings were fixed up for surgical work. There were 170 beds in a building. Such a hospital group of 1,500 beds was always located near a railroad, so that the wounded soldiers could be carried from the front to the base hospital. McDill of Milwaukee was carrying out the Dakin method of treatment of wounds, while the speaker and his associates carried out various other methods in addition to Dakin's method. They irrigated the wounds or used a continuous flow, employing the little glass bulbs that are associated with Murphy's continuous drip saline enemas to see at what rate they were using the solution. They put a suture through the tube and skin to hold the tube in place and irrigate in that way. They used boric

solution, salt solution, plain water and iodin solutions. They found that where they left a wound widely open it would clean in a few days, but where a wound was not left open it remained dirty for a long time. Wounds that were kept wide open from the beginning got well very quickly, while those wounds that were made by pieces of shell going through the thigh or arm, with small openings, got well slowly.

Regular Meeting, Nov. 29, 1916.

A CLINICAL AND EXPERIMENTAL STUDY OF THE METASTATIC ARTHRITIDES; A REVIEW OF THE 859 CASES FROM THE CLINICAL AND ANIMAL EXPERIMENTATION OF THE LATE DR. JOHN B. MURPHY.

Dr. Phillip H. Kreuscher, who read the paper, stated that it was based on a study of 859 clinical cases. Particular stress was laid on the following points: 1. Every case of acute general infection is surgical and must be treated surgically. 2. Those lesions thought to be infections in the joint cavities are in reality infections about the joints, outside of the joint cavity. 3. There is a definite incubation period for every metastatic arthritis. 4. The joint fluid does not contain bacteria in a large percentage of the cases. 5. Metastases to the joints occur because of a definite, logical reason.

The treatment of metastatic arthritis was surgical. Arthritis no more belonged to the domain of internal medicine than did acute fulminating appendicitis. Treatment by internal medication and external applications was as irrational as the same treatment applied to a perforating gastric ulcer.

Regular Meeting, Dec. 6, 1916.

THE BONE DISEASES FREQUENTLY SEEN BY THE PRACTITIONER; PATHOLOGY AND DIAGNOSIS; LANTERN SLIDES AND SPECIMENS.

Dr. Richard R. Smith of Grand Rapids, Mich., pointed out that the bones are constantly undergoing certain changes during infancy and youth. They showed marked changes in growth and structure, in keeping with other parts of the body; but during old age they undergo atrophy and change such as other parts of the body do. Bone atrophy is a condition with which the practitioner comes in contact clinically. Bone atrophy occurs in one of three ways: Through lacunar absorption, through canalization and through halisteresis, producing somewhat different forms of atrophy, but still all belonging to this general category. The first type of atrophy he called attention to is that due to old age. Senile atrophy may affect the whole skeleton. It affects the long bones and spongy vertebrae. These vertebrae become porous and friable, so that one may saw through them as fast as they would through rotten wood. The bones of the cranium and bones of the face are especially liable to senile atrophy. All are familiar with the atrophy of the lower jaw as seen in old age. The bones of the cranium show these changes.

Regular Meeting, Dec. 13, 1916.

THE LATE OPERATIVE RESULTS IN EXOPHTHALMIC GOITER.

Dr. Vernon C. David said that of 200 successive cases of exophthalmic goiter operated upon at the Presbyterian Hospital from 1905 to December, 1914, 11, or 5½ per cent, died in the hospital. Of the operative procedures lobectomy was done 60 times, curing 24, greatly improving 21, slightly improving 13, and failing to benefit 2 patients. In their cases 38 per cent were cured and 40 per cent were greatly benefited, while Judd and Pemberton, in a report of 121 cases operated in 1909, report 45 per cent cured and 30 per cent greatly benefited, making in each instance about 75 per cent of all cases that received a marked benefit or cure from the operation.

HUNGER AND APPETITE IN DISEASE

Professor A. J. Carlson of the University of Chicago gave a lantern slide demonstration of many experiments, showing the contractions of varying degree which take place during the digestion and as hunger increases. When the hunger pangs are very severe they constitute almost a spasm. When there is moderate hunger the contractions come on very slowly and are simply an exaggeration of the contractions of digestion. Within the last two or three weeks he has been able to demonstrate with bismuth meal just when the pylorus opened and he thinks that fact will throw new light on the so-called hunger pains in gastric and duodenal ulcer.

DIAGNOSIS AND MANAGEMENT OF URETERAL CALCULUS.

Dr. Lewis Wine Bremerman stated that of 89 cases which had come under his observation, 87 were males and 2 were females. In 22 cases the stone was in the lumbar portion of the ureter; in 8 cases in the iliac portion, in 51 cases in the pelvic portion and in 8 cases in the intramural portion. There were only 2 cases in which there was more than one calculus. In one case one stone was impacted in the lumbar portion and the other in the intramural portion. In the second case both stones were impacted in the intramural portion and showed only one shadow in radiogram. There was only one case of bilateral ureteral calculi and one case of ureteral stone on one side and a renal pelvic stone on the opposite. The author recommended a method which he considers safe, one in which there is no mortality, and in which there are no serious after complications. This method consists in dilating the ureter below the stone with appropriate instruments and with the aid of the operating cystoscope. This may usually be accomplished without even a local anesthetic. Occasionally one dilation is sufficient, but in most cases it is necessary to dilate several times.

Regular Meeting, Dec. 20, 1916.

SEMINAL VESICULITIS AND PROSTATITIS TREATED BY VESICULOTOMY AND PROSTATIC DRAINAGE.

Dr. John H. Cunningham of Boston stated that the selection of cases for seminal vesiculotomy should include those who have any of the local or general manifestations dependent upon acute and chronic focal infections in these organs, which cannot be overcome by the usual nonoperative methods of treatment.

He submitted a clinical classification which serves to select the cases suitable for operation, namely, the inflammatory group, rheumatic group, pain group and neurasthenic group. His operative experience includes 36 cases in the inflammatory group, 67 in the rheumatic group, and 8 in the pain group. There has been no mortality. He has operated on no cases in the neurasthenic group, but many of the patients falling under other headings had neurasthenic symptoms which improved or disappeared with the relief of their material symptoms. In the inflammatory group there are 36 cases. Fourteen of them were of the acute variety, three having suppuration in the prostate as well, and two, besides showing pus in the vesicles and prostate, had a unilateral suppurative epididymitis. There were four other cases in which rupture of the vesicle or prostatic suppuration had invaded the ischiorectal fossa. There were five cases in which the suppuration was confined to the vesicles.

Twelve of these fourteen cases can be considered cured, and all showed the immediate improvement incident to the evacuation of pus from whichever source. With the establishment of drainage, pain was relieved, the temperature and leukocytes dropped; and it remained only to care for the infection in the urinary tract. Twenty-two of the thirty-six cases in the inflammatory group were of the chronic variety, having received local treatment over periods of months or years, the process being relatively quiescent at times to be followed by acute exacerbations without known cause or from obvious lowering of the general or local resistance. In the rheumatic group there were 67 cases. Many of these patients had been invalids periodically for many years. Some had nonarticular affections, while others had multiple joints and tendon affections. Seven had so-called spurs of varying types on the under surface of the os calcis, and when present were always bilateral. Most of the cases had received nearly all known forms of treatment with varying benefit, but none had been cured. Complications attending the operation are the opening of the rectum, postoperative hemorrhage, and epididymitis.

J. V. Fowler, M. D., *Secretary.*

Carry a fine handkerchief and then forget to cover your mouth when you cough?

When our vices quit us we flatter ourselves, that is, we who quit them.

CHICAGO OPHTHALMOLOGICAL SOCIETY

A regular meeting was held May 22, 1916. The president, Dr. William E. Gamble, in the chair.

THE PURPOSE AND PLANS OF THE ILLINOIS SOCIETY FOR THE PREVENTION OF BLINDNESS

Miss Carolyn C. Van Blarcom stated the purpose of the society to be the prevention of unnecessary blindness and to conserve vision through the efforts of a lay organization. The eyes of new-born babies should be treated prophylactically, and affected eyes should be subjected to treatment. The society is a go-between between the medical profession and the lay public. Its plans are to digest medical teachings and place them before the general public, and to bring under medical supervision the largest possible number of afflicted babies. This is not so simple as might be thought. The Illinois Society has been in existence actively for three years. It has secured the enactment of the excellent law for the early reporting of such cases to the State Board of Health. In Illinois the gratuitous distribution of the prophylactic medicine is provided for, and adequate dispensary facilities are already in existence in the state. This makes an almost ideal machinery to cope with this problem. In a short time there have come under the observation of the speaker six blind or partially blind children in Chicago, which blindness would have been preventable. The society is as yet doing foundation work only in Chicago. This blindness is solely due to the lack of proper care, and it is the purpose of the society to supply this lack. The speaker cited various instances of cases of preventable blindness, one instance showing a reprehensible lack of attention on the part of a physician. The gist of the cause in all these instances was ignorance and neglect. The remedy is through the dissemination of formation and bringing to the lay public a realization of the seriousness of the condition.

Secondary infections are as serious as the primary infections. It is important for the mothers to take the children to the eye clinics, leave them in the hospital, when necessary. This measure is sometimes enforced by the arm of the law. An instance of this was cited, as occurring in Chicago. If the need is realized, relatives will usually take the babies to the dispensaries, on their own initiative. Widespread publicity is of fundamental importance.

The Illinois law requires the reporting of cases of sore eyes in infants within six hours. This is for the benefit of the babies which are not under medical care. A frank endorsement and enforcement of this law by vigorous methods is essential.

The speaker related the experience encountered by the organization in Massachusetts, and the great success they attained was accomplished by publicity and prosecutions.

The burden of this work rests upon the medical profession. It is the business of this Society for the

Prevention of Blindness to place before the lay public the recommendations of the medical profession. The principal needs are publicity and compliance with the reporting law. A nurse is needed, however, for the investigation of local situations and conditions. It is desirable to know the particulars about all the babies treated in the eye clinics and to follow up such babies, especially those whose mothers have failed to return to the clinics when instructed. Also the society should know about babies taken from the hospital against the advice of the doctors. Card statistics for information are desirable. The great need of lecturers before clubs, organizations, churches, settlements, schools, etc., in this co-operation is needed by the members of the Chicago Ophthalmological Society. Lantern slides can be supplied. The organization needs the united backing of the Opthalmological Society in its work.

DISCUSSION.

President Gamble said he had felt the need of organized work in this direction, and that it is the duty of the Chicago Ophthalmological Society to help. The president said that the chair would entertain a motion for the appointment of a committee to draft resolutions endorsing the work of the Society for the Prevention of Blindness.

It was moved, seconded and carried that a committee be appointed to endorse the work of the Illinois State Society for the Prevention of Blindness, and the chairman thereupon appointed as members of such committee Drs. Findley, Suker and Tivnen, who retired and later brought in a report, which is embodied in the minutes.

Dr. George F. Suker said that dispensary cases have been neglected by the dispensary men. The dangers in these cases have not always been duly explained by the clinic men to the parent. There has been, in some cases, an absolute failure of this duty. It is absolutely wrong to treat these gonorrheal patients as dispensary cases. They should be treated in the hospital. Most of the cases occur among people who are eligible to admission to the Cook County Hospital. The baby is the innocent victim in these cases. A goodly majority of the gonorrheal eye cases occur after the first child is born. The cause is due to the damnable rascality of the man.

The speaker said he would not hesitate to denounce any minister who would not permit lectures of this kind, as suggested by Miss Van Blarcom, to be given from his pulpit.

Dispensaries should be required to report these cases promptly for hospital treatment. All the hospitals should be forced to take such cases, even if they are not "financially profitable" to them; at least, their interns and nurses would get valuable experience and the hospitals owe this much to them and to the public at large.

Dr. Thomas Woodruff said that very few hospitals will take cases of babies with infected eyes, unless they have private rooms. The Society for the Prevention of Blindness has been endorsed by the Chicago Association of Commerce and occasional hearings before the ways and means committee of that organization have been promised.

It is the duty of the state's attorney to prosecute any physician, midwife or others present at birth of babies who violate the law. This society will bring to the attention of the proper authorities any failure to report babies' sore eyes and let them act.

The Society for the Prevention of Blindness desires an endorsement from all possible sources and desires to organize branches throughout the cities of this state. Lecturers are badly needed, as stated.

Dr. Joseph C. Beck pointed out the intimate relations between the eye, ear, nose and throat and reported some unusual cases which were grouped under each of the following headings: 1. Labyrinth irritation from the eyes and vice versa. 2. Ethmosphenoiditis with orbital cellulitis simulating cavernous sinus thrombosis. 3. Infected ethmoidal cyst with periodical exophthalmos. 4. Recurrent unilateral iritis of eighteen years' duration. 5. Non-suppurative simusitis causing practically blindness, diffuse edema of the retina, operation, followed by complete recovery of vision. 6. Tumor of hypophysis with unusual complications. Post-mortem findings and description of a new operation. 7. Suppurative dacryocystitis cured by the canaliculo-nasal route.

DISCUSSION.

Dr. Harry S. Gradle stated the case of anterior ethmoidal cysts was of particular interest in that the ocular findings were negative. The vision was normal; the fields were normal; no central scotomata could be found and the blind spot was not enlarged. We are accustomed to look for disturbances in these functions, in purulent disease of the ethmoid, because of the extension of the disturbance towards the apex of the orbit. The optic nerve is here involved and the changes can be detected. In all likelihood, the extremely thickened periosteum that was found during operation prevented any spread of the ethmoidal trouble towards the region of the optic nerve.

The case of recurrent irido-cyclitis was of special interest in that no definite etiological factor could be found. To the speaker's mind there are two possibilities; the first and the least probable is that of sinus disease of long standing, low-grade type. The second and more likly of the two is a chronic enterogenous intoxication.

The relationship between the eye and the ear is of extreme interest, and presents one phase which Dr. Beck has not brought out. This is manifest in the deafness which occurs during the course of a sympathetic ophthalmia. Such cases have been reported to the number of twenty-three and have been explained theoretically on the assumption of Elschnig's anaphylactic theory of sympathetic ophthalmia. According to Peters of Rostock, the basal membrane of the labyrinth contains a small amount of pigment identical with the pigment found in the uvea. Consequently any sensitization of the body by antigenic absorption of uveal pigment will also sensitize the labyrinth which may be involved in an anaphylactic outbreak. This would explain the deafness of the bilateral labyrinthine type that occasionally accompanies sympathetic ophthalmia. He had occasion to see such a case in consultation recently.

Dr. Beck, in closing the discussion, said that in this craze for ascribing infection to the teeth, tonsils, sinuses, appendix, etc., the strong probability of lues and gonorrhea as etiological factors has become somewhat overlooked. The teeth are now receiving very much attention from all possible sources. This particular patient shown by the speaker is malnourished and needs to have good food hereafter.

The subject of the pigment in the labyrinth is yet to be demonstrated histologically.

BONY TUMOR OF THE VITREOUS CHAMBER SPRINGING FROM THE CILIARY BODY.

Dr, Heman H. Brown reported the following case: J. Fuller, aged 18 years and 4 months; only child; family history so far as could be determined is good. No evidence of eye disease in either parents or parents' families. No trace of tubercular trouble with patient or families. Aside from the eye difficulty, the patient seems perfectly normal in every way. Except measles, there has been no physical illness during her entire life. Her birth was normal (no instrumental delivery), and at birth the child in every way seemed physically normal. At four months

of age the right eye became very red and inflamed, causing great suffering. The attack of inflammation lasted for two months, during which time she was under the care and treatment of a competent ophthalmologist, who pronounced the case glioma of the retina, and advised the removal of the eye. The inflammation, however, slowly subsided and the eye assumed a state of quiet, but the pupil remained widely dilated and fixed, with a distinct yellow reflex. This dilatation remained a permanent feature of the eye. (The mother thinks the eye was blind after the first attack, but previous to that time had noticed nothing to attract attention to the eye.)

Three months later the patient suffered a second attack of inflammation similar in its manifestations to the first though shorter in duration. Glioma was again diagnosed and enucleation advised. The diagnosis was concurred in by a consultant at this time.

Following this seizure the eye assumed a slightly staring appearance. No further difficulty was experienced until at five years of age, when she suffered another attack of inflammation. This was the most severe of all, and the ophthalmologist in attendence again advised enucleation to avoid, as he stated, rupture of the eye-ball. There is no evidence at hand of irritation or disturbance of the left eye at any time. Aside from an occasional redness of the right eye, with little suffering, lasting but for a few days at a time, no further disturbance was experienced until three weeks previous to the time she consulted me, on August 15, 1915. At that time the following conditions were present:

Left eye: Vision, 20/20; normal in every way. Right eye: Light perception only, and in a state of general inflammation. This condition, she stated, had existed for three weeks. The cornea was slightly steamy in appearance, with bulging at the nasal side and noticeably thinner. Springing immediately from the limbus, there existed a wedge-shaped abrasion of the cornea, at its base four millimeters in width. This extended directly across the center of the cornea to the limbus on the temple side. Above and below the apex of this abraded area an imperfect view of the eye chambers could be had. The pericorneal injection was deep, indicating a marked ciliary inflammation. The sclera likewise deeply injected. The anterior chamber deepened and iris out of sight. Aqueous and lens slightly turbid. Although the media could be imperfectly viewed, yet the yellow reflex from the posterier chamber could be seen quite distinctly. The motion of the eye ball was entirely unimpaired, but the upper lid edematous and dropping. The suffering to the patient was excruciating. The history of the case and its present physical findings suggested but one course to follow, namely, enucleation, which he did under a general anesthetic on September 9, 1915. When under the anesthetic a hard tumor could be distinctly felt within the eye chamber, apparently smooth in its outline. The eye, after enucleation, presented nothing of particular interest. There were no adhesions to the orbital contents or marks of cicatricial contraction in the sclera, as might be expected after a traumatism.

The pathologist designated the tumor as a form of coloboma with a fetal inclusion of bony tissue.

In conclusion Dr. Brown called attention to three points of interest: 1. The quite evident fetal origin of the tumor. 2. The confusion which may arise from diagnosis of tumors of the new-born eye. 3. The entire bone formation would seem to have confined itself to the ciliary body.

DISCUSSION.

Dr. Adolph Gehrmann said that in this specimen we have bone which is perfectly quiet. There is no evidence of any new growth or retrogression of the bone. There is bone in the ciliary portion and also farther back. Active growth or degenerative change through the osteoclasts at the time of the enucleation is out of the question. The tumor is absolutely benign. As to bone formation after injuries, there is one statement in the literature that the bone extends to the lens. The occurrence of bone after injuries occurs about as bone develops after injuries elsewhere when there are persistent inflammatory or circulatory changes.

There are three theories as to how and when this growth occurs as a metaplasia. First, Cohnheim's theory of fetal inclusion of embryonic cells; secondly, bone formation on account of changes in the blood vessel walls, the protoplasm laying down bone itself; thirdly, the bone theory of Ribbet that bone cells get free and float through the circulation and lodge at various points and form new bone structures.

In this case evidently the formation occurred early because of the quiescent and the comparative youth of the patient. Whether there was any fetal inclusion originally is a matter of surmise. There is a possibility that bone is formed in the fetus and that in the body later in life may be caused through the same circulatory disturbance which is in the nature of calcification of cells around the blood vessels. Thus we obtain the structure of the bone and the peculiar relation to the blood vessels and their walls. Bone may be found in any very vascular location and also where vascularity has been brought about by initiation and congestion as in keloids or in muscles where pressure has irritated for a long time. Sometimes, as in a case shown by Dr. Day, bone was found in the lungs. In Dr. Brown's case there may have been some choroidal disturbance in early life with the formation of a shell of bone in the choroid and in the adjoining ciliary body. It is certainly perfectly well formed, quiet bone structure that has not changed for many years.

Dr. Brown, in closing the discussion, said that there is no lack of literature upon bony shell formation in the vitreous chamber, having their origin in the capillary system of the choroid. They are very common. But an individual confinement as this is to the ciliary process is unique, and especially so in that there is no possible evidence of injury which seems to precede bony formation, such as we find the literature teeming with. There is no pan-ophthalmitis, no external irritation or infection; a bone formation arising from the ciliary process, without a previous history of injury, is rather unique.

Dr. George F. Suker reported two cases, one of fat inplantation into the eviscerated scleral cavity and the other a case of implantation of fat into the capsule of Tenon after an enucleation. The speaker expressed the belief that ocular operations should be for two purposes, one primarily for the surgical and functional effect, and the other for the cosmetic effect. The speaker has found but few conditions which demanded enucleation in which he could not do an implantation of some sort or another. Recession of the upper lid is avoided and a much greater range of motion is obtained by implantation. The simple enucleation is not the ideal surgical procedure according to the accepted meaning of that term. The implantation method takes longer and the strictest surgical

technic must be observed. The reaction following is much greater than in a simple enucleation. The transplantation of fat of the self-same patient is the best; the absorption of the fat is very little, especially when put into the scleral cup. The fat is usually taken from the side of the abdomen on the same side of the body as the enucleated eye. The piece of transplanted fat is generally about again as large as the ball itself when put into Tenon's capsule, and when put into the scleral cup a little larger than the eye itself,—avoid undue pressure and manipulation of the fat.

GRUNDY COUNTY

Members of the Grundy County Medical Association and men connected with the medical profession were entertained at the home of Dr. H. M. Ferguson, Morris, Ill., December 1. A lecture on "Bone Surgery" was given by Dr. C. R. G. Forester, of the Westside Hospital, Chicago. Dr. Forester was a guest of Dr. Ferguson and gave his lecture by special request.

The lecture was technical and based on actual experience of Dr. Forester in the operating room and was interspersed with explanations and anecdotes of treatment of unusual fractures. A resolution to ask the supervisors to provide for indigent tuberculosis patients was passed.

Seventeen members and visitors were present.

IROQUOIS-FORD COUNTY

The thirteenth annual meeting of the Iroquois-Ford Medical Society was held in Watseka, Ill., December 5, 1916.

After a surgical clinic held in the hospital, where various operations were performed by different members of the society, the society met at the Iroquois Hotel, where we were entertained at dinner and smoker, followed by an address by Dr. E. B. Coolley of Danville.

Dr. Coolley had to cut his address short on account of catching his train.

The annual election resulted as follows: President, O. O. Hall; vice-president, F. B. Lovell; secretary, S. S. Fuller; censor, W. F. Buckner; delegate, H. D. Junkin; first alternate, R. N. Lane; second alternate, D. W. Miller; legislative committee, N. T. Stevens, S. S. Fuller and J. L. Shawl.

A paper entitled "Our Secretary" was read by Dr. D. W. Miller. A vote of thanks was tendered Dr. Miller for serving the society for three years as secretary.

On motion the secretary was directed to communicate with each member of the society and get an expression on dividing the society into two organizations—one for each county.

Seventeen members and visitors were present.

D. W. Miller, Secretary.

McHENRY COUNTY.

The sixth annual outing meeting of the McHenry County Medical Society was held at Leonard's Hotel on the east shore of Crystal Lake, Friday, August 11, 1916.

Eighteen members were present.

A brief statement of the finances and membership was presented by the secretary and accepted as presented. A communication from the Legislative Committee urging medical men to take an active part in state politics in the interest of the profession and the people and showing how Senator A. J. Olson and Representatives Graham, Shurtleff and Vickers voted on the notorious Optometry Bill, which was fought for years by the medical profession and finally succeeded last year in squeezing through by one vote in each house. Vickers was the only one who aided the Doctors by voting and working against this notorious bill.

The following officers were elected: President, N. L. Seelye, Harvard; vice-president, C. W. Goddard, Harvard; secretary-treasurer, Hyde West, Woodstock; censor, W. V. Gooder, Marengo; delegate for two years, A. B. Smith, Woodstock; alternate for one year, C. C. Peck, Harvard.

Dr. A. J. Markley then made a few remarks relative to his candidacy for the State Legislature, calling attention to the fact that each Doctor should be able to influence fifty votes, and if every Doctor would take the time and trouble to do so what a power the medical profession could be in securing good, clean constructive legislation.

Dr. Edwin P. Sloan then read a highly instructive paper on "Intestinal Stasis," bringing out many valuable points in connection with the work of Bainbridge and as exemplified in his own work.

Dr. H. D. Eaton's paper on the "Practice of Medicine in Mexico," being based on personal experience of some years, was highly interesting.

Following the scientific program the meeting adjourned for dinner.

N. L. Seelye,
Secretary-Treasurer.

Regular Meeting, October 13, 1916

The October meeting of the McHenry County Medical Society was held in the City Hall at Marengo, Friday, October 13, 1916, at 10:30 a. m. Eleven members were present.

Dr. J. E. Allaben, of Rockford, gave the Society a very interesting talk upon the subject, "Some suggestions Upon the Treatment of Hypertrophied Prostate." The subject was a most interesting one and very ably presented, Dr. Allaben bringing out some very valuable points. The paper provoked a lively discussion which was useful to all. A rising vote of thanks was tendered Dr. Allaben, and we hope that we may have the pleasure of another visit in the near future.

Adjourned for dinner.

Hyde West, Secretary.

Regular Meeting, November 16, 1916

The November meeting of the McHenry County Medical Society was held Thursday, Nov. 16, in the Princess Theatre, Woodstock, at 10:30 a. m., nineteen members present.

Dr. Glenn E. Wright, a member of the Chicago Medical Society, who recently located at Crystal Lake, was elected to membership in this society.

After the regular business was dispensed with the

president called upon Dr. Richard H. Street, of Chicago, president of the Illinois State Homeopathic Society, who gave a short talk on "Modern Medical Education." The meeting was then thrown open to the laity, who were invited by card to hear the speaker of the meeting, Dr. Gilbert FitzPatrick, who presented a most excellent paper upon the subject, "The Teaching and Practicing of Modern Obstetrics." This was illustrated by lantern slide and moving picture, the latter demonstrating a Caesarean operation. This paper was of inestimable educational value as well as interesting, and was generously discussed by the Doctors in closed meeting. Despite bad roads, the turnout was good, and everyone felt repaid for having come, as this was an unusually good meeting.

A vote of thanks was tendered Drs. Street and FitzPatrick, also Mr. John Miller, proprietor of the Princess Theatre, who so kindly donated the theatre for the occasion. Adjournment for dinner.

HYDE WEST, Secretary.

ROCK ISLAND COUNTY

Few meetings in the history of Rock Island County Medical Society have equaled the December meeting in interest and attendance. Through fortuitous circumstances we were able to have Dr. Fred H. Albee of New York City as guest of honor.

Scott County Medical Society and Iowa and Illinois Districts Medical Society were invited to attend this meeting. Sixty physicians sat at the dinner, which preceded the meeting, and over one hundred listened to the address.

Dr. Albee has recently returned from France, and the subject of his address was "War Experiences in France." He described his work in bone graft, illustrating each step by moving pictures of the operation. He also described the Carrel method of sterilization of wounds, which was illustrated in the same manner. He related many incidents which came under his own observation, which illustrated the wonderful self-sacrifice of many scientists at work in the European war. At the close of his address the societies gave him a rising vote of thanks.

A. E. WILLIAMS, Secretary.

Personals

Dr. Jacob I. Krebbs, Polo, is under treatment at a sanatorium in Freeport.

Dr. Frank M. Barker, Waukegan, was operated on for appendicitis, December 12.

Dr. Wm. C. Meacham has removed from Somanauk and will locate in Ontario.

Dr. Hugh Q. Allison, Grayville, who has been ill with pneumonia in a hospital in Olney, is convalescent.

Dr. John L. Porter conducted an orthopedic clinic at the Blodgett Memorial Hospital, Grand Rapids, December 6.

Dr. Hayes W. Carlin, Chicago, suffered a fracture of the left leg by the overturning of his automobile, November 20.

Dr. J. Elliott Royer, Chicago, has been elected professor of neurology in the College of Medicine of the University of Illinois.

Dr. Ralph H. Kuhns has returned to Chicago after eight months' experience as surgeon in a base hospital in West Prussia.

Dr. Lincoln S. Lacy, Pittsfield, has been appointed surgeon of the Wabash System, succeeding Dr. Samuel B. Peacock, resigned.

Dr. Otto L. Schmidt, Chicago, was elected second vice-president of the Chicago Historical Society at its annual meeting, November 21.

Dr. Geo. P. Gill, of Rockford, gave an address, December 5, to a large audience at Lena on his experiences in the war zone in France last year.

Dr. Armandus Horn, of Chicago, is said to have been asphyxiated by carbon monoxide escaping from glass tubes that were accidentally dropped.

Dr. Charles Paul White, of the class of 1915, Northwestern University Medical School, and ex-interne of Wesley Memorial Hospital, has located in Kewanee.

Dr. Gottlieb A. Lurie, Chicago, has been appointed by the state board of health district health officer for the southern district of Illinois, with headquarters at Mount Vernon.

Miss Harriett Fulmer, for many years head of the Visiting Nurses Association of Chicago, has taken up her new position as head of the public health work of Cook County, which includes all the territory outside of the city.

Dr. J. Elliott Royer, Chicago, has returned from three years' special work in neurology, in Germany and England—the last year being in the military service—and has been elected assistant professor of neurology in the College of Medicine of the University of Illinois.

Drs. B. W. Sippy, A. F. Sippy, Fred J. Diennen and Gatewood were in an auto on the way to the Presbyterian Hospital, but arrived as patients instead of attending physicians, owing to a collision with a truck. Dr. A. F. Sippy sustained a fracture of a rib and Dr. Diennen, a fracture of the hip. The others were cut and bruised.

News Notes

—Rockford physicians found their offices so full of applicants for vaccination during the recent smallpox epidemic that they could not attend to other patients.

—Dr. Gideon H. Hoffman has been elected president; Dr. Peter J. McDermott, vice-president, and Dr. Ira M. Miller, secretary-treasurer, of the Kewanee Physicians' Club.

—At the annual meeting of the Chicago Institute of Medicine, held December 5, Drs. Frank Billings, N. S. Davis and Frank S. Johnson were elected members of the board of governors.

—The question of birth control is said to be of increasing interest to women's clubs. Debates have shown a great variety of opinions both on this and the somewhat related one of bastardy.

—The Public Health Service has forbidden the prescribing of heroin by officers of the service. It is hoped that this example will influence physicians generally to use less dangerous agents.

—"Dr." Clarence J. Keysbee of Austin was arrested by the federal officers on the charge of smuggling drugs from Canada. He was also arrested for peddling drugs from a stolen automobile.

—Trouble is brewing in the Juvenile Court, Chicago, for physicians who do not report births promptly. It is claimed that birth reports are a necessary check on parentage in the cases that come before the court.

—A loud rattling of skeletons will be heard when the United States district attorney discloses the names of the would be great who have invested in fake diplomas. It is said that the fakes are not limited to Illinois nor to medical institutions.

—St. John's Hospital, Springfield, has just completed, at an expense of $10,000, a new free dispensary which contains ten rooms for minor surgical, medical, genito-urinary and nose and throat work, a milk modification laboratory and a dispensing room.

—Dr. Joseph B. DeLee, Chicago, is quoted to the effect that 50,000 babies and 20,000 mothers die annually in the United States because of improper care at childbirth, in an address at the annual meeting of friends of the Chicago Lying-in Hospital and Dispensary.

—The Institute of Medicine has received a home and club-house at 2636 Prairie avenue, from Mrs. Frank Coolidge, in memory of the late Dr. Frank Coolidge. Dr. Frank Billings, Dr. Frank Johnson and Dr. N. S. Davis were elected to the board of governors.

—A child at Bald Mound developed infantile paralysis as diagnosed by Dr. Crawford, state health inspector, and five other physicians. Another physician attributed the symptoms to a fall it had sustained some time previously, though it had been up and around after the fall.

—At the annual meeting of the Illinois Society for the Prevention of Blindness, November 21, Mr. Charles S. Hutchinson was elected president, and Drs. Edward V. L. Brown, Frank Cary, William H. Wilder, and Thomas A. Woodruff were elected members of the executive committee.

—The regular respiration of a man accused of murder while being examined, the respirations being recorded on the "pneumograph," convinced the jury that he was insane. The instrument is said to have been perfected by Dr. A. A. Dolear of Jacksonville. The trial was before Judge Hickman at Pittsfield.

—The new Robinson Hospital is completed and Drs. Herbert N. Rafferty, Cyrus E. Price, Jonas W. Carlisle and A. Lyman Lowe have moved their offices into the new building. A reception was tendered to the local neighboring physicians at the hospital, November 24, and it was opened on the following day.

—Additional gifts for the endowment of the great medical institution mentioned in the December Journal have been announced by President Judson as follows: $300,000 from Frederick H. Rawson, president of the Union Trust Company, and $200,000 from Charles H. Ruddock, of New York, formerly of Chicago.

—The following officers were elected at the close of the forty-third annual meeting of the North Central Illinois Medical Association at Pontiac, Dec. 7: President, Dr. Fred Wilcox, Minonk; vice-presidents, Dr. D. S. Conley, Streator; Dr. O. B. Will, Peoria; secretary-treasurer, Dr. George A. Dicus, Streator.

—The twenty-fourth meeting of the Robert Koch Society for the Study of Tuberculosis was held at the Hotel Morrison, December 21. Dr. Roswell T. Pettit, Ottawa, spoke on "The Importance of Mixed Infection and Pulmonary

Tuberculosis," the discussion being led by Dr. James L. Anderson of the Chicago Winfield Sanatorium.

—Junius B. Wood has been running a serial history of the colored people of Chicago in the *Daily News*. According to the historian, one Jean Baptiste Point de Saible, a free colored man from Santo Domingo, was the original settler 137 years ago. At present the colored element is increasing rapidly and their sanitary and health problems will become a matter of public concern.

—A case involving a new point of law occurred in the court of Judge Joseph B. David in connection with a claim for damages on account of injury to the spine in a street car accident. The claimant, a woman, is a member of the Pentecostal Church and refused medical treatment, depending on prayer for a cure. The company claimed that medical treatment would have reduced the damage.

—The International Hobo College, 915 West Washington street, Chicago, was recently opened with classes in English, journalism, law, nature study, first aid to the injured and public speaking. It is said that Dean Walter Pond of the Cathedral has offered the school the use of the cathedral gymnasium, where they can become expert in Japanese jiu jitsu, French savete and Marquis of Queensberry rules. Hobos are migratory workers and should not be confused with bums or tramps.

—The directors of the Fenger Memorial Fund announce that the sum of $500 has been set aside for investigations in medicine or surgery in 1917. The money will be used to pay all or part of the salary of a worker, the work to be done under direction in an established institution, which will furnish the necessary facilities and supplies free of cost. It is desirable that the work undertaken should have a direct clinical bearing. Applications giving full particulars should be sent to L. Hektoen, 629 South Wood street, Chicago, before Jan. 15, 1917.

—Plans for a new infirmary, to cost $500,000 and to be an integral part of the Municipal Tuberculosis Sanatorium, have been completed by the architect, Mr. Jarvis Hunt, and are under the direction of Dr. Albert J. Ochsner. The infirmary will have a large roof garden; kitchen and dining-rooms will be on the top floor; on three sides there will be direct sunlight; at the south end of each floor will be a large sun parlor, and there will be an English basement for the provision of light occupation for patients. The building is intended to handle only such patients as are too ill for cottage treatment.

—At the annual meeting of the Illinois Association for the Study and Prevention of Tuberculosis, held at Springfield, November 9 and 10, the name of the organization was changed to the Illinois Tuberculosis Association and the following officers were elected: president, Dr. George T. Palmer, Springfield; vice-presidents, Dr. William A. Evans, Chicago; Hon. E. M. Mangan, Aurora; Dr. Charles B. Johnson, Champaign, and Dr. Lewis C. Taylor, Springfield; secretary, Dr. Jeanette C. Wallace, Peoria, and treasurer, Mr. David R. Forgan, Chicago, and executive committee, Drs. James W. Pettit, Ottawa; Ethan A. Gray, Chicago; Edward W. Fiegenbaum, Edwardville; Orville W. McMichael, Chicago; Mr. George W. Perkins, Chicago, and Mrs. L. A. Adams, Jacksonville.

—The Council of the Chicago Medical Society adopted the following resolution at the meeting, November 14:

Realizing the value to a community of scientific articles in the newspapers when the same have been prepared by scientific men, or are the results of investigations by authorities in the field of medicine and surgery, the council of the Chicago Medical Society approve of the publication of such facts as will tend to promote the physical welfare of the people, but decry the publication of sensational articles which are not founded on facts based on intelligent and honest research, and would welcome such co-operation between the lay press and the organized medical societies as would prevent the harm that ensues from the publication of articles which are misleading and untrue. Therefore, be it

Resolved, That the council of the Chicago Medical Society request the great newspapers to use every means to prevent their being exploited by unethical physicians.

Marriages

NATHANIEL ISADOUR BASKIND, M. D., Chicago, to Miss Marian Propp of Des Moines, Iowa, in Chicago, November 22.

EMIL BUNTA, M. D., to Miss Emily Howard, both of Chicago, at Crown Point, Ind., October 28.

CHARLES D. CAMP, M. D., to Miss Lillian A. Harris, both of Chicago, November 25.

WILLIAM GUSTAVUS SACHSE, M. D., Morris, Ill., to Miss Edith Janet Naden of Newark, Ill., November 30.

CHARLES EDWARD SCHARF, M. D., to Miss Graze Elizabeth Mullin, both of Chicago, November 30.

ANTHONY THOMAS WEBER, M. D., to Miss Hazel Lucile Berton, both of Chicago, at Crown Point, Ind., November 16.

Deaths

RODNEY J. BUNCH, M. D., Table Grove, Ill.; St. Louis University, 1906; a Fellow of the American Medical Association; for two years assistant superintendent of the St. Louis City Hospital; died at his home, December 7, from acute miliary tuberculosis.

JAMES A. CLYNE, M. D., Joliet, Ill.; Albany, N. Y., Medical College, 1886; aged 56; a Fellow of the American Medical Association; once president of the Will County, Illinois, Medical Society; for twenty years local surgeon of the Chicago & Alton Railroad; health commissioner of Joliet in 1893 and 1894; died at his home, recently, from disease of the throat.

HENRIETTA M. FARQUHARSON, M. D., Chicago; Northwestern University Women's Medical School, Chicago, 1900; aged 50; a Fellow of the American Medical Association; a specialist in diseases of the eye; died at her home, December 9.

JOSEPH PHILIP JONES, M. D., Chicago; University of Michigan, Ann Arbor, 1890; a member of the Illinois State Medical Society; died at the home of his son, in Marcellus, Mich., November 25, from cerebral hemorrhage.

GEORGE PASFIELD, M. D., Springfield, Ill.; Washington University, St. Louis, 1886; aged 85; surgeon of Camp Butler, near Springfield, during the Civil War; one of the wealthiest land owners of the state; died at his home, December 11.

NELSON L. SWEETLAND, M. D., Newark, Ill.; Rush Medical College, 1867; aged 73; a veteran of the Civil War; died at his home, November 21.

THOMAS LEIGH LANIGAN, M. D., El Paso, Tex., formerly of Lincoln, Ill.; Medical College of Indiana, Indianapolis, 1905; aged 34; died in El Paso from a bullet wound self inflicted while temporarily insane.

HERMAN ANSCHER, M. D., Chicago; Bennett Medical College, Chicago, 1890; aged 53; died at his home, November 24, from cerebral hemorrhage.

RILAND DILLARD BERRY, M. D., Springfield, Ill.; Medical College of Ohio, Cincinnati, 1879; aged 61; formerly a Fellow of the American Medical Association; a member of the Illinois State Medical Society; for many years a practitioner of Springfield; died at St. John's Hospital of that city, November 3, from cerebral hemorrhage.

MOSES SIMMONS BRUNDAGE, M. D., Rockford, Ill.; Rush Medical College, 1883; aged 58; died at his office, November 19, from heart disease.

JOHN CHARLES CROWELL, M. D., Paw Paw, Ill.; Rush Medical College, 1891; aged 58; died at his home, November 17, from cerebral hemorrhage.

CLAUDE BERNARD FOREMAN, M. D., Kane, Ill.; St. Louis College of Physicians and Surgeons, 1897; aged 41; formerly a Fellow of the American Medical Association; a member of the Illinois State Medical Society; died in a hospital in Springfield, November 27, a week after an operation for appendicitis.

ALICE MITCHELL, M. D., Chicago; Women's Medical College of the New York Infirmary for Women and Children, 1885; aged 54; for twenty years a missionary of the Presbyterian Board of Missions at Woodstock, Mussowrie, U. P., India; died in Chicago, November 21, after a thyroidectomy for exophthalmic goiter.

DECOU CARPENTER MOULDING, M. D., Chicago; Dearborn Medical College, Chicago, 1906; College of Physicians and Surgeons, Chicago, 1909; aged 46; a Fellow of the American Medical Association; consulting physician to the Beulah Home and Hospital, and house physician at the Washingtonian Home; president of the White Cross League, and physician in charge of the Burr Oak Sanatorium, Wheaton, Ill.; died at the Augustana Hospital, Chicago, November 21, a few hours after an operation for perforating ulcer of the stomach.

ANDREW JAMES PARK, M. D., Oak Park, Ill.; Harvard Medical School, 1852; aged 90; formerly coroner and superintendent of education of Oxford County, Ont.; later a practitioner of New York and Chicago; well known as an astronomer and physicist; died at the home of his daughter in Oak Park, November 25, from senile debility.

NORA JOHNSON ROSS, M. D., Chicago; Chicago College of Medicine and Surgery, 1911; aged 47; a Fellow of the American Medical Association and a member of the staff of the Mary Thompson Hospital; died at her home, December 1, from septicemia.

FRANCIS ADAM P. SIEBER, M. D., Chicago; Rush Medical College, 1883; aged 75; a veteran of the Schleswig-Holstein and Franco-German wars; once health commissioner of Lake View; died at his home, November 24, from chronic nephritis.

WILLIAM HENRY STRENG, M. D., Richmond, Ill.; Chicago College of Medicine and Surgery, 1907; aged 38; a Fellow of the American Medical Association; was instantly killed, November 21, at a grade crossing in Waukegan, Ill., in a collision between a Chicago and Milwaukee Electric train and the automobile in which he was riding.

WILLOUGHBY WALLING, M. D., Chicago; University of Louisville, Ky.; aged 68; a member of the Illinois State Medical Society; United States Consul at Edinburgh, Scotland, from 1885 to 1888; for four years head of a wholesale drug firm in Indianapolis and later a specialist on diseases of the ear, nose and throat; died at his home, November 27, from myocarditis.